THE UNIVERSITY OF HONG KONG

AN EMPIRICAL STUDY OF HOUSING SIZE EFFECT ON INVESTMENT RETURN – AN EXPLANATION FOR SPECULATIVE ACTIVITIES IN HOUSING SECTOR

A DISSERTATION SUBMITTED TO THE FACULTY OF ARCHITECTURE IN CANDIDACY FOR THE DEGREE OF BACHELOR OF SCIENCE IN SURVEYING

DEPARTMENT OF REAL ESTATE AND CONSTRUCTION

BY

WONG LAI LING

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Declaration

I declare that this dissertation represents my own work, except where due acknowledgement is made, and that it has not been previously included in a thesis, dissertation or report submitted to this University or to any other institution for a degree, diploma or other qualification.

Signed: 

Name: WONG LAI LING

Date: 10th April, 2008.

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Abstract

This dissertation is written to examine whether under extensive speculative activities and speculators, who are defined as high risk-taking investors, can result in higher investment return. For this research, an empirical study of housing size effect on investment return is carried out. The results of the study have shown that Class E investors are taking higher risk and they can enjoy higher return and even risk-adjusted return. The hypothesis of the study, Class E has the highest Sharpe Ratio, is accepted. As a result of large housing sizes generate effect on higher investment return, it is appropriate to define speculators as short-term investors who are willing to take higher risk for higher capital gains as well as risk-adjusted return.

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Chapter 1 Introduction

Residential housing is one of the most important sectors in the real estate industry because it is demanded by every Hong Kong citizens. Some of the buyers own the residential housing for living, whereas some are for investment. I am going to study the details of speculative activities in Hong Kong's residential property market by the following ways namely discussing the background of the Hong Kong property market; setting the research questions and objectives; defining the scope of study and how important of the study. Finally, methodological framework and the structure of this report will be discussed.

1.1 Background

Over the past decade, Hong Kong has experienced many changes including the transferring of sovereignty of Hong Kong and Asian Financial Crisis 1997, as well as the outbreak of the Severe Acute Respiratory Syndrome (SARS) in Hong Kong 2003. All of the incidents had a great impact on the economy of Hong Kong especially for the property market. Fig 1 shows the change of the property prices of the Hong Kong property market from 1997 to 2007.

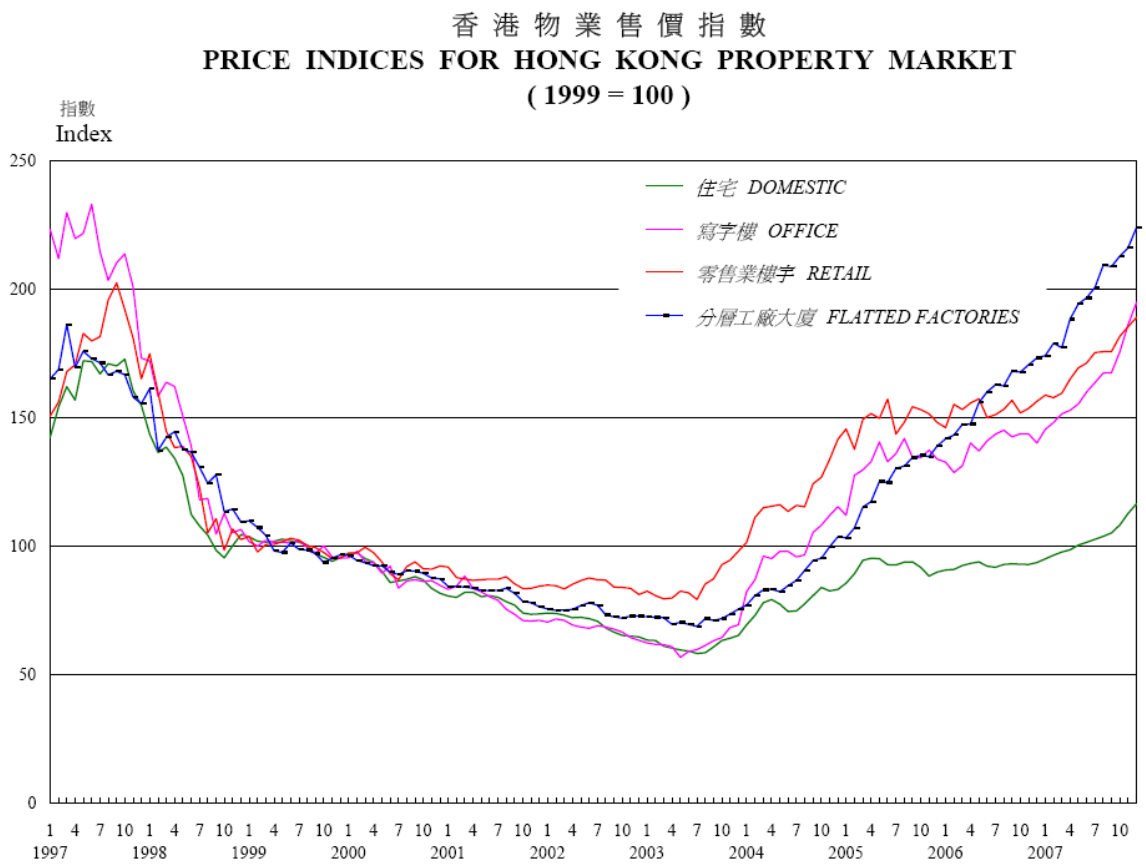

Fig.1 Graph of price indices for Hong Kong property market (1997-2007)

Source: Rating and Valuation Department (2007)

Because of the Asian Financial Crisis 1997, the property price if Hong Kong has declined from 1998 to 2003 (the year of outbreak of SARS). After Hong Kong experiencing the economic slump for 6 years starting from 2004, the price of the property market has recovered gradually. For instance, four residential units in HK were on the list of “Top 10 luxury housing (Asia)” announcing by the Forbes, one of the most popular business and financial magazines in US.

Besides, there were many newspaper articles reporting the transactions of residential units with sky high price which broke the record of the highest transaction price in the market. For example, one of the duplex units of The Legend[1], with the record of the highest price per sq. ft. of HK$34,000 in October 2007 was broken by a duplex unit of Branksome Crest[2] with price per sq. ft. of HK$40,910 (transaction price of HK$2.9billions) in November 2007. (Wen Wei Po, 24-11-2007) In addition, the "Skyhigh" project[3], a newly built luxury housing in the Peak, their asking price was at least HK$4 billions (price per sq. ft. of HK$60,000) for each detached house.

Such a sky high price would break the highest transaction price record for Hong Kong property market. (Sing Tao Daily, 12-12-2007) Why do the residential units' property price were being boosted up to such a high price? Who are the sellers and purchasers of those residential units? Those sellers are usually described as speculators and the property prices are boosted up to such a high level that is normally due to the speculation. Purchasers of those units may be the real-users, the investors or the speculators.

[1] Flat B, 58&60/F, Block 1, The Legend, 23 Tai Hang Drive, Jardine's Lookout, Hong Kong. (Wen Wei Po, 24-11-2007)

[2] 52/F, Branksome Crest, 3 Tregunter Path, Mid-Levels, Hong Kong. A duplex unit with swimming pool on the roof. (Wen Wei Po, 24-11-2007)

[3] There were four newly built detached houses for the "Skyhigh" project (10 Pollock's Path, the Peak, Hong Kong). (Sing Tao Daily, 12-12-2007)

1.1.1 Purchasers in residential property market

In residential property market, the purchasers of residential units are generally classified into three categories: real-users, investors and speculators. People who purchase the property solely for accommodation are defined as real-users. People who purchase property mainly for investment and sometimes even for accommodation between the period of purchasing and selling of the property are defined as property investors. People who want to maximize their profits by investing when they anticipate that the property will go up in value are usually defined as real estate speculators. The speculators are more willing to take higher risk for higher return than another two types of purchasers.

People who invest for obtaining the maximum profit would like to minimize their risks as well. It is always presumed that the speculators are more capable of anticipating the trend of property price accurately than others, and they are more willing to take higher risk. When they are willing to take higher risk, they can gain high return if they anticipate the future trend of price accurately. According to the tendency of willingness of risk-taking, we can distinguish the difference between speculators and investors.

1.1.2 How to define speculation and speculators?

It is common to see that there are many definitions for the word “speculation”. By searching from different dictionaries, speculation is described in a few sentences only. For example, speculation is defined as “an investment in stocks, property, or other ventures in the hope of financial gain but with the risk of loss” (Oxford Dictionary 2007); “Taking large risks, especially with respect to trying to predict the future; gambling, in the hopes of making quick, large gains” (Investor Words 2007). Business Dictionary (2007) describes speculator as “futures market participant who attempts to gain from anticipated change in prices of commodities or financial instruments, and speculators aim primarily at quick profit from a short-term acquisition of assets, where future market is a market in which participants can buy and sell commodities and their future delivery contracts.”

The above definitions represent the concept of speculation and speculators in most people’s mind. To sum up, speculation has three characteristics: high risks, aiming at large gains, and a way to make quick profit. All investors would like to maximize their profit but they have to minimize their risks at the same time. Speculators are considered as those who are willing to take high risks expecting for

getting big reward. The larger profit the investors want to gain, the higher the risks they have to take. In this dissertation, the issue of “whether speculators can make larger gains when they take higher risks” is going to be investigated.

1.1.3 Nature of speculative activities in Hong Kong

Because of the lower transaction cost for buying large amounts of properties, speculators generally buy many properties when they expect that there will be increasing in future prices. Thus, the property prices will be boosted up by the speculators. For other buyers, real-users and some investors will then suffer from purchasing properties in high prices.

In addition, due to the lower cost of purchasing in presale market, speculators are more involved in presale market in Hong Kong. Hence, speculators dominate the residential market in Hong Kong especially in presale market. Under the extensive speculating activities in the property market, the bubble on speculation will be created. The government interference of property market controls the speculating activities at times. For example, the government imposed the stamp duties on transactions in presale housing contract. In 1996, the government limited the period which

developers could pre-sell housing units to nine months before the completion and did not allow transferring of the presale contracts in the secondary market.

1.2 Research questions

The research questions of this dissertation are to investigate whether it is appropriate to define speculators as those who are willing to take higher risks for higher returns by considering housing size effect on investment return. Before testing this issue, different definitions and the characteristics of speculators will be studied first. Then, the active tendency of speculative activities in residential housing class will be identified. In addition, finally, the risk and return of speculation among different classes of residential units will be discussed.

1.3 Research objectives

The title of this research is “An empirical study of housing size effect on investment return – an explanation for speculative activities in housing sector”. The research is aimed to at examining the appropriateness of defining speculators as those who are “willing to take higher risks for higher returns” by carrying out an empirical

study of housing size effect on investment return. To achieve this aim, there are three objectives for study:

1. To examine how speculators are defined in property market.
2. To analyze how residential properties are classified in Hong Kong.
3. To test housing size effect on investment return.
4. To interpret why speculative activities can result in a higher risk-adjusted return.

1.4 Scope of study

Real estate is a sector that largely affects has high influence on the economy of Hong Kong. In the real estate industry, it is broadly divided into residential, commercial and industrial, either private or public sector. In this dissertation, the field of study is residential property market in Hong Kong. In addition, the focus will be placed on real estate speculators and speculative activities in the residential property market.

Although speculators also dominate the presale market, the presale market is not going to be investigated in this research. This is because price indices of different

classes in presale market of Hong Kong are not available; therefore there is limited data for testing the relationship between risk and return in presale market. Another reason is that research period is limited for considering both spot and presale market. Therefore, only spot market will be considered in this research.

1.5 Importance of the study

Property prices are determined by the fundamental economic factors. When there is no speculation in the market, purchasers behave rationally and they purchase properties at prices based on the fundamental economic factors. When speculative trading exists, this affects the fundamental economic factors and the property prices. This dissertation is a reference for defining speculators, testing for the appropriateness of defining them as “taking higher risks for higher returns” by considering the housing size effect on investment return and providing the explanation of the result.

1.6 Methodological framework

For this research, the methodology consists of several parts.

A literature review on different definitions of speculators will be given so as to provide an overview on how the economists and scholars define speculators and test for the existence of speculation.

Among those different kinds of methods on classifying the residential properties in Hong Kong, the best way of classification will be chosen.

After identifying the method of classification, the hypothesis will be deduced. The volatility of price and the rate of return for different classes will be calculated. Then I will go through the volatility of price which represents the risks that is directly proportional to return. A risk-adjusted ratio will be used for comparing return per unit risk of different classes.

Finally, the result of the test will be discussed in depth especially the part of the validation of the hypothesis.

1.7 Structure of the study

This dissertation consists of 7 chapters.

Chapter 1 – The contents include background, research question, research objectives, scope of study, the methodology framework and arrangement of this report.

Chapter 2 - A literature review on various definitions of speculators in real estate market, the causes and the effects of speculation. The relevant studies on measurements of risk-adjusted returns will be reviewed. Finally, a summary of the literature review will be given.

Chapter 3 – An overview of residential property market in Hong Kong. This includes presentation of importance of the Hong Kong's property market to its economy, review of history of the property market and various curbing speculation measures taken by the Hong Kong government.

Chapter 4 – Providing an introduction of different methods for classifying residential properties in Hong Kong together with the selection of the method of classification for the study.

Chapter 5 – Developing the hypotheses for the research. Next, explaining the research design with outlining the procedures on how the hypotheses are tested. Finally, describing the data, the method of constructing datasets and all sources being used in this research.

Chapter 6 – Presenting and discussing on the results in the validation of the hypothesis.

Chapter 7 – The conclusion of the research with limitations of the study and recommendations on further study.

Chapter 2 Literature Review

In this chapter, I would like to go through various literatures that are related to my research. The literature review consists of four parts: (1) the introduction of different definitions of speculators in real estate market; (2) the causes of speculation; (3) the effects of speculation; (4) the risk-adjusted return ratio which is closely related to the content of this research; and (5) the summary of the literature review.

2.1 Literature review on defining speculators

The aim of this research is to investigate the appropriateness of defining "speculators" of the housing market in Hong Kong, and therefore I would like to show you a clear picture on the word "speculators" by referring various aspects of the literatures. Actually, there are many ways to describe "speculators" and let me introduce it in detail.

2.1.1 Taking higher risks for larger and quick gains

2.1.1.1 Financial market speculators vs Real estate speculators

In financial market, speculators are defined as "investors who take positions that increase their exposure to certain risks in the hope of increasing their wealth" (Renaud, 2003). Although we are not concentrated on the financial market, similarly the real estate speculators have one same characteristic as the real estate speculators. Both speculators are willing to take "certain risks" in order to "increase their gains".

Another aspect to describe speculators is “an investment will earn its expected rate of return” (Reilly and Brown, 2006). Both financial and real estate speculators can be in form of individuals or corporations, the only difference between these two groups is the real estate speculators purchase real estate properties whereas the financial market speculators purchase financial instruments. According to (Feagin, 1982), real estate speculators can also be defined as "an entrepreneur or corporate entity which purchases (or develops) real estate with the hope of a profit from rising land a property values".

2.1.1.2 Speculators vs Investors

Speculators can be classified as the investors because they purchase real estate properties for investment. However, Speculators, unlike true investors who typically are in it for the long haul and often engage in quickly buying and then reselling. Investors and speculators have fundamentally different objectives, in terms of investment horizon and risk profiles. Speculators are known as "short-term investors" whereas investors have a longer investment planning horizon. Speculators' period between buy and sell is shorter than that of the investors. Speculators sometimes are signified as short-term investors instead of that buy-and-hold. Investors will tend to be sought out buy-and-hold quality properties, even though they may subsequently sell them in a shorter period as to rebalance their portfolio. "It is used to identify investors who purchase but hold it vacant when those investors anticipate an opportunity of a profitable development in the future" (Malpezzi and Wachter, 2005). Concerning the term "short", how short is the investment? In financial perspective, short-term investment is normally not more than 1 to 2 years.

Tse and Webb (2004) expressed speculation in a more mathematical sense by referring to Reichert's (1990) paper: speculation is a variable that "measures the

acceleration in regional housing prices at time over the previous two years". Tse and Webb (2004) suggested that magnitude of speculation used is the rate of change in the housing price index. For testing their model, they defined speculation as "rate of change in the housing price index over the past twelve months subtracted from the rate of change in the housing price index over the twelve months previous to the period (moving one month at a time)". Once again, it is reaffirmed that short-term investment for speculation is normally not more than 2 years.

To sum up, speculators have three characteristics in terms of risks, returns and investment period. They are short-term investors who are willing to take higher risks with the hope of making larger and quick returns.

2.1.2 Capital gains

Since speculators purchase and sell for gains in a system of capitalist market, they can be defined as capitalists (Feagin, 1982). As mentioned in Chapter 1.1.1, purchasers of residential property are broadly divided into three types: real-users, investors and speculators. Real-users are those who purchase property solely for accommodation and own use. Property investors are those who purchase property

mainly for investment and sometimes even for accommodation between the period of purchasing and selling of the property. Speculators are those who want to maximize their profitability by investment when their property go up in value, and they are more willing to take higher risk for higher return than the other two types of purchasers. Therefore, the main difference between real-users and speculators is that the main purpose for the real-users to purchase the residential properties is solely used for accommodation while the main purpose for the speculators to purchase the residential properties is only used for making large and quick gains. Speculators are always described as a group who "purchase real estate mainly for the purpose of collecting capital gains rather than enjoying the benefits from using it" (Kim and Seoung, 1993).

2.1.3 Arbitrage by considering information availability

Many economists and scholars also looked at the meanings of speculation from another angle. Speculation means making profit by considering information available in the market so as to determine the market price (Malpezzi and Wachter, 2005). “Liquid” market is described as a market that many investors are well informed about the current prices when the prices are observable. The essential characteristic of a “liquid” market is that there are ready and willing buyers and sellers at all times.

“Illiquid” market is described as a market that involved less investor and they can volatile the prices easily because the cost of the discovering prices is become costly. Meanwhile, when the profit-earning speculators enter into the market, this increases the market’s liquidity. Speculators are key contributors to the liquidity of a market, or asset because they are assumed to be short-term investors and they tend to buy and sell more rapidly than the others. Speculators seek to profit from anticipated increases in a particular market price. By doing this, they provide the capital needed to facilitate the liquidity.

2.1.4 Feedback traders

Instead of concerning the expectation of future price, speculators also focus on past price expectation formed by past values of price (Tse and Webb, 2004). In this case, speculators are described as “feedback traders”. They are the “traders whose demand is based on history of past returns rather than the expectation of future market fundamentals” (Culter et al., 1990).

When the expectations of the future prices are based on the increases of past price, this may lead to speculative bubbles. Investors are then “speculating”

continuously regarding to the past outstanding rates of price. Such an expectation of price is formed by an extrapolation, which is regarded as speculation, and such speculation generate real estate cycle, even when it is not based on demand and supply fundamentals. (Malpezzi and Wachter, 2005) In this case, expectation of backward looking is defined as a speculation.

2.2 Literature review on the causes of speculation

In the previous section, different definitions of speculators are introduced. As to examine under what conditions would induce speculation, in this section, causes of speculation are going to be discussed.

2.2.1 Uncertainty/expectation of future price

Real estate speculators invest in properties when they expect price appreciation of property prices in the near future. As mentioned before, they are more willing to take higher risk for higher capital gain. Risk is known as uncertainty about expected price. Therefore, uncertainty about movement of future price is an essential condition for speculation to take place. If there is no expectation of future price, speculators will

not have incentive to invest.

"A speculative trader sells/buys goods under uncertainty, with the intent to resell/repurchases as those motivated solely by perceived capital gains." (Ho, 2000) When probability of price appreciation is high, they will purchase. Otherwise, they will sell. Capture of expected price appreciation is a prime force for investors to enter the property market. They consider residential unit as an investment instead of occupation. For the homeowners, they may promote/delay a purchase so as to capture/avoid price depreciation. Finally, this may result in a higher price unit under anticipation of expected appreciation.

2.2.2 Movement of property price

Whether movement of property price causes speculation or vice versa is an unsolved chicken and egg paradox, which is stated by Ho and Kwong (2002). As to resolve this paradox, they have tested the relationship between property price and speculative activities to see whether speculation is the culprit of driven force of property price. From their testing, they found that "changes in property prices cause speculative activity, but not the reverse" and "speculative activity is not the culprit of

property price surge".

For that reason, uncertainty about future property price and existence of property price movement is criteria for causing speculation. If there is no movement of property price and future expectation, speculators will not be induced to enter the property market.

2.3 Literature review on the effects of speculation

After discussing cause of speculation, by considering how speculators affect the property market and the economy, in this section, I am going to study the details on the effects of speculation.

2.3.1 Stabilize market by dampening price fluctuation

Most people think that speculation helps stabilizing real estate price. It is because speculators make profit by buying at a low price and selling at a high price. Therefore, this can reduce the amplitude of price fluctuation and hence stabilize the market. (Kim and Seoung, 1993) However, this can only be done when speculation is carried out

successfully. That's mean if the speculators fail to anticipate the trend of the future price accurately, they may not be able to stabilize the market.

Many economists have different point of views on the interpretation of speculation. Most of them interpreted that profit-earning speculators could stabilize the market and minimize the price fluctuation. However, some other economists proved that speculation in fact destabilize the market.

Guth (1994) quoted Milton Friedman's hypothesis that speculators gain the profit by buying low and selling high, and thus it tends to dampen or stabilize the price fluctuation. He explained the literature by presenting a counter example "profitable destabilizing speculation". The term "destabilize" means increasing the price fluctuations' frequency, volatility or variance. He proved that profitable speculation could destabilize the market.

Concerning the argument of whether the speculators stabilize or destabilize the market, Kim and Seoung (1993) has indicated from an article: Krashinsky and Milne (1987) and it is suggested that "Whether speculation operates to stabilize or destabilize price fluctuation depends on the magnitude of the increase in the expected

capital gains following an initial increase in the current price".

2.3.2 Driving up property prices

Speculation is one of the prime forces behind increase of property price and in reality there are two kinds of speculative activity even though they are difficult to distinguish (Wong, 1996). The first type of causing the increase of property price is based on the fundamental changes of supply and demand conditions in the market. The second type which is not based on the fundamental changes of supply and demand conditions but still cause property price increases are purely "the speculative bubbles". For any increases of property price due to the speculative bubbles should be curbed because they would collapse the property prices and threaten the financial system.

Speculative bubbles

Extensive speculation creates bubbles, which is a situation about the "backward-facing or speculative pricing behavior that drive actual investment decisions and prices, as higher prices, over time, increase supply, these prices are no

longer sustainable". The bubble bursts since optimistic investors are abolished and do not have any capital to invest in the market (Malpezzi and Wachter, 2005). Testing for an existence of a bubble can be done by compare interactions between the housing price and market fundamentals. (Hui and Yue, 2006)

Guth (1994) examined the feedback effects and the speculative bubbles by an informational price theory. When uninformed traders buy securities because they have inferred from prices that the informed traders are purchasing, a feedback effect is introduced. A self-enforcing Bayesian Nash equilibrium solution is developed to a game in which the informed group occasionally tries to fool the uninformed traders to believe that the asset returns are better than they actually obtained. Sometimes this deception succeeds. A bubble results, and after the crash over, the informed group turns out to have gained at the expense of the uninformed. The speculative bubbles result from fully rational and expected payoff maximizing behavior by all market participants.

Thomsett (2007) specified that widespread speculative activity in real estate is one of factors which creating real estate bubble. In order to study real estate bubble, he emphasized the distinction between "valuation" and current "market value".

Valuation is the process of assessing the market value of a real estate based on a logical comparison. The cost of materials or lands will be compared with the properties nearby or similar to their neighborhoods, and other logical criteria are used to establish the valuation of property. In a real estate bubble, valuation may be distorted by artificial factors and other causes, as a result the market value is leading to increase rapidly and eventually it has to be corrected. On the other hands, market value is the price that is agreed by a buyer and seller. In an orderly market, a property's market value will be based on the appraisal and valuation principles. However, in a real estate bubble, the principles of valuation may be suspended or ignored entirely.

When the investors or the speculators find the price is rising, they would like to get into the market and take the actions. The more the speculators, the greater the artificial demand. The bubble feeds itself unit it cannot grow any longer, and then it bursts.

The "greed factor" and the "greater-fool theory" are the two important factors in bubble-driven environments (Thomsett, 2007). The greed factor is a tendency to get into the market because the prices are rising. Speculators would never fulfill the profit

they gained. Once they gained double profit from the capital, they will put the profit back in and buy more until the profit is evaporated and the bubble bursts. The greater-fool theory is someone buying something not because of you believes that it is worth the price, but rather you believe or make an assumption that you will be able to sell it to “a bigger fool” for an even higher price.

Asian Financial Crisis 1997

Over the year of 1997, a huge housing bubble was formed and burst in the property marketing of Hong Kong. During the Asian Financial Crisis 1997, property prices were dropped sharply not only in Hong Kong but also happened globally. There are many reasons causing the Asian Financial Crisis, but the extensive short-term speculation in the stock market and real estate market is one of the root causes (Tse and Webb, 2004).

The Asian Financial Crisis 1997 was a remarkable event in the Asian countries’ history. Most likely, once the financial crises started, banking crisis would be followed. There are many studies related to the Asian Financial Crisis concerning the relationship between the housing bubbles and banking crisis. Although there was a

great fall of property prices and speculative bubbles in Hong Kong during 1997-1998 1998, there is no banking crisis (Renaud, 2003). However, Herring and Wachter (2002) proved that real estate bubbles and banking crises are correlated, even though one may occur without another.

To sum up, speculation can boost up property prices. Under extensive speculation, speculative bubbles would be created and burst when the boosted price are not sustainable. As a result, a sharp drop of property prices and financial crisis will be occurred. Speculation causes high price volatility, which it is a good indicator to determine which housing classes the speculators will active in.

2.3.3 Spreading and transfer of risks

It is often said that speculation has to be curbed but there is no solid reason support unless the speculative bubbles occur. From an economic point of view, speculation is economically desirable since it spread risks. (Wong, 1996) However, it can only be occurred when people has different attitudes toward risk, different expectation and assessment for the future price.

In Hong Kong, developers have to face considerable degree of risks since their investments are concentrated on one single local market (Wong, 1996). From the developers' perspective, selling of uncompleted residential units can transfer the risks from them to the purchasers. When speculators purchase the uncompleted residential units in a large amount, they can receive a discount by way of compensation for the risks. Therefore, speculative activities in Hong Kong are concentrated on the presale market as well. I am not going to discuss about the "presale market" in detail, but instead, I am focusing on the spot market.

2.3.4 Generating real estate cycle

According to different literatures quoted previously, there are many different interpretations of the words "speculation", "speculators" and "the real estate cycle". However, most likely there are many observers from various countries believed that speculation in the real estate market is "a prime mover of real estate cycle". (Malpezzi and Wachter, 2005)

Real estate cycle

Speculation is sufficient to generate real estate cycles, and actually what is the real estate cycle? Real estate cycle consists of four stages: boom, crisis, depression and recovery (Fig.2). The duration of completed a real estate cycle is normally 10 years. Therefore, real estate cycle is sometimes called “ten-year-cycle”. Features of the 4 stages are as shown in Table 1:

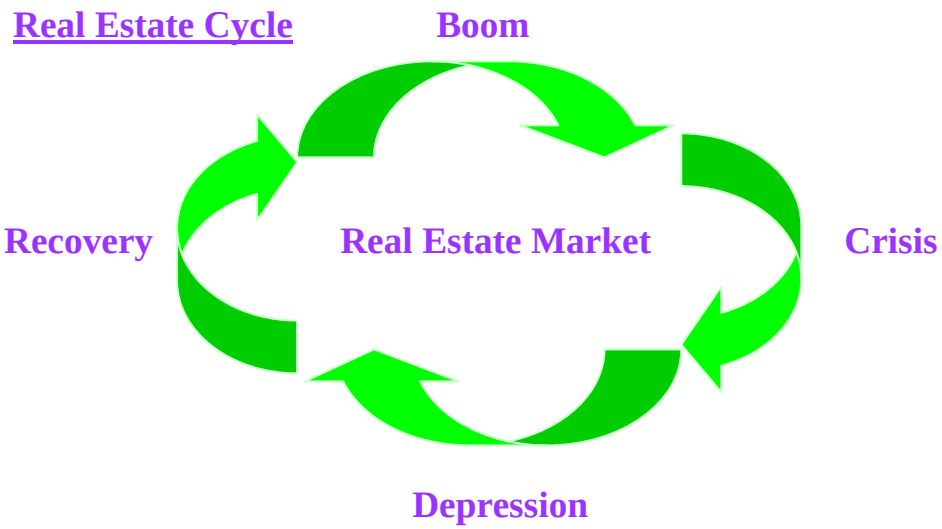

Fig.2 Real estate cycle (Tse, 2007)

Stages	**Features**	**Duration**
Boom	- High property price - Growing in price - Speculators enter the market - Many transactions	3 to 4 years
Crisis	- Decreasing growth rate of price - Price becoming falling from rising - No. of transactions decreases - Usually sudden	Less than or around 1 year
Depression	- Decreasing in price - Few transactions - Long transaction period - More speculators with negative net worth	At least 2 years
Recovery	- Stop falling of price - Market starts to improve - Price increases gradually - Nearly no speculators	3 to 4 years

Table 1 Four stages of real estate cycle (Tse, 2007)

2.3.5 Gentrification

Feagin (1982) specified that speculation might cause “gentrification”, an urban area that involved “the displacement of lower-income urbanites by higher-income urbanites”. The power of speculation can lead to Gentrification when the speculators buy properties where potentially attractive to a large amount of high-income people. The rents are increased following the gentrification and many existing tenants may force to move out from the properties. Speculation is involved because those properties are usually purchased at a lower price by the low-income people and it is suddenly turn out to be a large profit to those high-income people.

2.3.6 Comparing effects of speculation in real estate market and stock market

Compared with the stock market, real estate market is definitely illiquid (Thomsett, 2007). The reason is that real estate property prices tend to move in a slower cyclical pattern while stock market price tend to move in a faster way which can been seen on daily and weekly trends. The direction of stock market bubbles can be changed in less than one year whereas real estate cycle is moved comparatively

slow and requires a long period for recovery. Therefore, when housing bubble is burst, the property prices will have a sharp drop and sustain a low position for a longer period of time than that in the stock market. Besides, real estate market mainly affects the local economic but it is not influence a lot on the global side. Oppositely, stock market largely affects both the local and global economic.

Considering the risks of real estate investment with that of stocks and bonds, real estate investment is a relatively high-risk venture that reflects the uncertainties of a somewhat unpredictable market (Sirota, 2001). Generally, people invest in real estate are trying to minimize risk, preserve capital, and earn a profit. Real estate investments offer relatively higher yields, greater leveraging opportunities, greater income tax sheltering strategies, and a higher degree of personal control than most other types of investments.

2.4 Literature review on risk-adjusted return measures

Risk-adjusted return measure is a common way to compare different types of investment and portfolio performance. Although the study is not considering portfolio investment, a risk-adjusted return measure will be used for testing of hypothesis in the later part of the study. In this section, different kinds of risk-adjusted return ratios will be introduced.

2.4.1 Sharpe Ratio

Sharpe Ratio is a well-known risk-adjusted return ratio, which has been widely used for assessing portfolio performance. William Sharpe, a Nobel Prize winner, has first developed a risk-adjusted return ratio which is called “reward-to-variability ratio” in 1966. Although the ratio had become widely used, the name of the ratio was not popular. While developing of this risk-adjusted return ratio by Sharpe, different authors have termed the original version as the “Sharpe Index”, the “Sharpe Measure” or the “Sharpe Ratio”.

Sharpe Ratio is a measure of excess return per unit of risk of an asset. It measures the return and risk of an investment asset in comparison to a risk-free rate, which is "average rate in excess of the risk-free rate divided by standard deviation of portfolio returns" (Reilly and Brown, 2006). Over 30 years ago, Sharpe has made several revisions on his risk-adjusted return measures and trying to provide a more general and wider range of applications. The latest version is developed in 1994, by taking into account of risk-free rate over time:

Sharpe Ratio: $$S = \frac{E[R] - R_f}{\sigma}$$ (Original version in 1992)

$$S = \frac{E[R - R_f]}{\sigma} = \frac{E[R - R_f]}{\sqrt{\text{var}[R - R_f]}}$$ (Revised version in 1994)

Sharpe has another risk-adjusted return ratio, which is known as "return information ratio" (Sharpe, 1994). Instead of comparing with risk-free rate, the return and risk of an investment asset is relatively compared to its benchmark. It is done by rate of fund minus rate of benchmark and then divided by standard deviation of this excess return. However, it provides a less accurate measure than that of the Sharpe Ratio, because it provides a relative risk-adjusted return rather than an absolute one.

2.4.2 Treynor ratio and Jensen measure

Apart from Sharpe Ratio, Treynor Ratio and Jensen measure are also risk-adjusted return measures which are commonly used for assessing performance of fund managers.

Treynor Ratio is a risk-adjusted return measure which is calculated as “its average return in excess of risk-fee rate divided by its beta coefficient” (Reilly and Brown, 2006). Sharpe Ratio uses the standard deviation of returns as to measure the total risk, where as Treynor Ratio uses beta representing systematic risk. Therefore, Sharpe Ratio evaluates the fund manager based on both rate of return performance and diversification of risk.

For Jensen measure, it is “an absolute measure of a portfolio’s risk-adjusted performance, computed as the intercept in a regression equation where the excess returns to a manager’s portfolio and the market index are, respectively, the dependent and independent variables” (Reilly and Brown, 2006). Similar to the Treynor Ratio, the Jensen measure calculates excess return in terms of systematic risk. Hence, both measures do not directly consider fund managers’ ability of diversify risk.

Due to the reasons of providing a more accurate result, a simpler and easier measure to use, Sharpe Ratio is chosen as the risk-adjusted return measure for the research.

2.5 Summary of literature review

Table 2 below is a summary of literatures of different parts which has been reviewed.

Contents	**Literatures reviewed**
1. Definitions of speculators	
i. *Short-term investors:* *taking higher risks for larger and quick gains*	Renaud (2003) Reilly and Brown (2006) Feagin (1982) Malpezzi and Wachter (2005) Tse and Webb (2004) Reichert's (1990)
ii. *Purpose of investment:* *solely for capital gains*	Feagin (1982) Kim and Seoung (1993)

iii. *Arbitrage by considering information availability*	Malpezzi and Wachter (2005)
iv. *Feedback traders*	Tse and Webb (2004) Culter et al. (1990) Malpezzi and Wachter (2005)
2. Causes of speculation	
i. Uncertainty/expectation of future price	Ho (2000)
ii. Property price movement	Ho and Kwong (2002)
3. Effects of speculation	
i. Stabilize market by dampening price fluctuation	Kim and Seoung (1993) Guth (1994)
ii. Driving up property prices; *Creation of speculative bubbles;* *Case study:* *Asian Financial Crisis 1997*	Wong (1996) Malpezzi and Wachter (2005) Hui and Yue (2006) Guth (1994) Thomsett (2007) Tse and Webb (2004)

	Renaud (2003) Herring and Wachter (2002)
iii. Spreading and transfer of risks	Wong (1996)
iv. Generating real estate cycle	Malpezzi and Wachter (2005) Tse (2007)
v. Gentrification	Feagin (1982)
<u>Real estate market vs Stock market</u> ✧ *Real estate investment:* ✧ *less liquid investment;* ✧ *relatively high-risk venture*	Thomsett (2007) Sirota (2001)
4. Risk-adjusted return measures	
✧ *Sharpe Ratios;* ✧ *Return information ratio;* ✧ *Treynor Ratio;* ✧ *Jensen measure*	Sharpe (1994) Reilly and Brown (2006)

Table 2 Summary of literature review

Chapter 3 Overview of residential property market in Hong Kong

This research is focused on speculative activities of the Hong Kong's housing market, it is essential to know more about how it affects the economy and its history, especially for the concerning speculative activities. In this chapter, following by the importance of the Hong Kong's property market to its economy, history of the property market and various curbing speculation measures by the Hong Kong government will be reviewed.

3.1 Importance of property market in Hong Kong

Considering the weight of the property market in stock market and revenue of government, it can be seen that how important the property market is and how the property price largely affects economy of Hong Kong.

3.1.1Hong Kong stock market

Many stocks in Hong Kong are listed by developer companies and real estate

related companies. According to Bloomberg (2007)[4], based on market capitalization, among the top 40 largest stocks in Hong Kong, 12.5% of them are listed by property related companies. For examples,

- Sun Hung Kai Properties (Rank 16)
- Cheung Kong Holdings (Rank 18)
- Henderson Land Development (Rank 31)
- Hung Lung Properties (Rank 35)
- Sino Land (Rank 36)

3.1.2 Revenue of the HKSAR Government

In Hong Kong, properties and their related business contribute much revenue to the government every year. Referring to Fig.3, 9% of the government's general revenue is coming from properties and investments and 7% is from general rates.

[4] Source: Hong Kong Log.com website (http://www.hongkonglog.com/read.php/10.htm) (Retrieved on 16-2-2008)

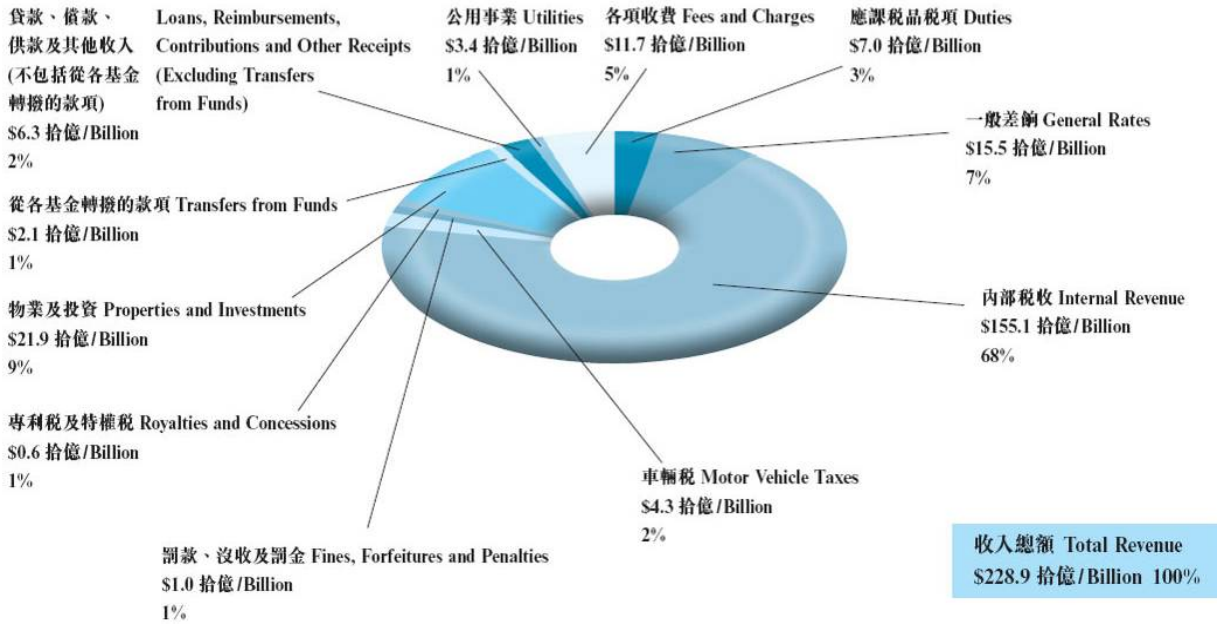

Fig.3 General Revenue for the year ended 31st March 2007

Source: Treasury Department (2007)

Due to the scarcity of land and constraint of the land supply in Hong Kong, the government generates large amount of revenue through land sale every year. According to Capital Works Reserved Fund, source of land premium is categorized as sales of land by public auction and tender, private treaty grants, modification of existing leases, exchanges and extensions, and fees received in respect of short term waivers. These have become a major source of the government's revenue. They have contributed approximately $37 billions in 2007. (Table 3)

Capital Works Reserved Fund		
Revenue		
	2006 ($'000)	2007 ($'000)
Land Premium:		
Sales of land by public auction and tender	10,673,260	7,200,500
Private treaty grants	4,459,637	23,188,328
Modification of existing leases, exchanges and extensions	14,073,698	6,324,827
Fees received in respect of short term waivers	265,353	286,758
	29,471,948	**37,000,413**
Investment Income	1,377,545	4,358,479

Table 3 Capital Works Reserved Fund

Source: Treasury Department (2007)

Apart from the land premium, a stamp duty is also a significant source of the government's revenue in property market. In 2005 to 2006, revenue of stamp duty

was about 7% ($17.9 billions) of the total revenue. (Fig.4) Stamp duty is known as charging on certain types of documents which is imposed by the Stamp Duty Ordinance (Cap.117) under law of Hong Kong. Documents which are mainly subject to stamp duties are as follows:

1. Conveyance on sale (i.e. Assignment),
2. Agreement for sale of residential property,
3. Lease of immovable property (i.e. Tenancy Agreement), and
4. Transfer of Hong Kong stock.

(Source: website of Inland Revenue Department, retrieved on 6-2-2008))

Besides stamp duties, those duty payers also have to pay profit tax liabilities regarding assessable profits from purchasing and selling of landed properties through business trading in Hong Kong.

The Inland Revenue Department is responsible for collecting stamp duties as well as the property tax. For the owner of buildings or land in Hong Kong, they have to pay property tax, at 16% of their actual rent, minus 20% allowance as maintenance and repair works. If a corporation owns a property for carrying business in Hong

Kong, they can be exempted from the property tax, but they still have to pay profits tax in respect to profits obtained from their ownership.

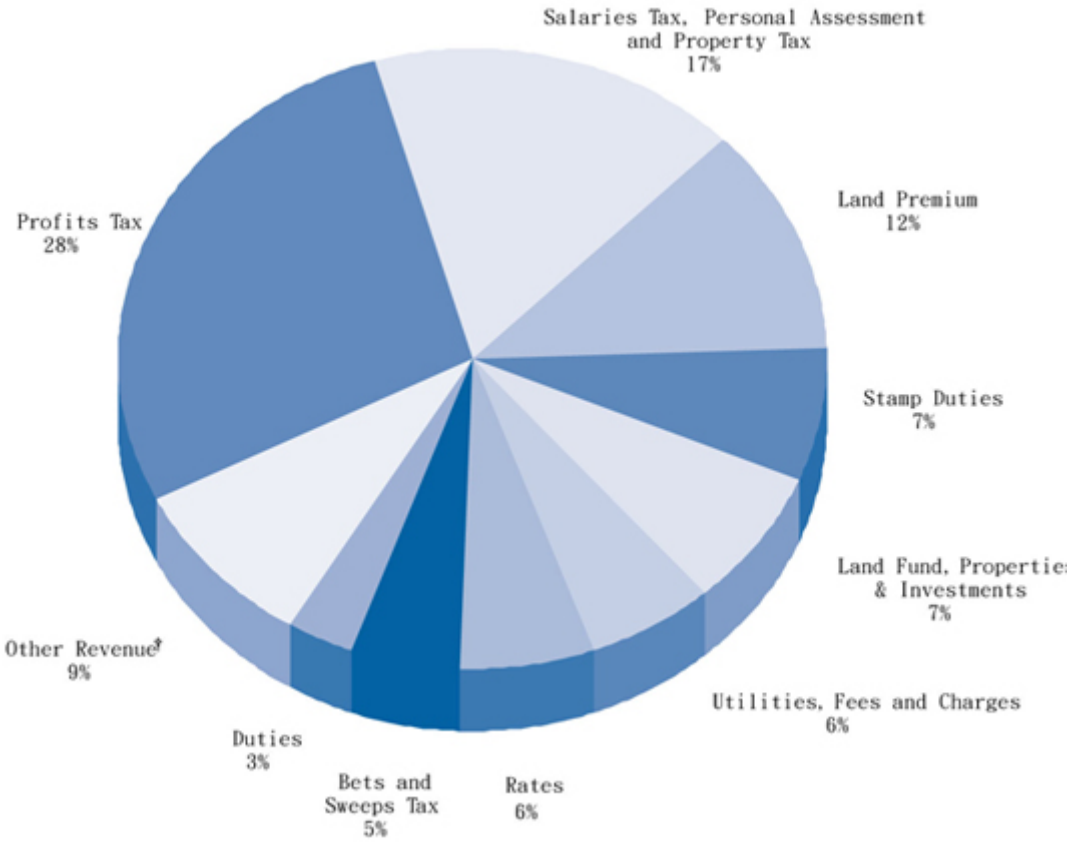

Fig.4 Major sources of revenue (2005-2006)

Source: Hong Kong Year Book 2006

For the rates and government rent, they are billed and collected by the Rating and Valuation Department. Rates are a kind of indirect tax and they are charged at a percentage of an assessed rateable value on landed properties. The assessed rateable

value is known as an expected annual rent of the property. By general revaluation by the RVD, rateable values are updated every year, and this can also reflect the changes in market rents. The Legislative Council is responsible for determining the percentage charge of the assessed rateable value. According to the RVD, the current percentage charge of rates is 5%. During the term of land leases, no matter new or extended land leases, the lessee has to pay government rent to the government for the right to occupy the land. According to the Government Rent (Assessment and Collection) Ordinance (Cap. 515), the government rent is charged at "3% of the rateable value of the property and is adjusted in step with any subsequent changes in the rateable value." In 2005 to 2006, the total rates and government rent collected were 6% ($14.16 billion) and 2% ($4.7 billion) of the total revenue respectively.

After reviewing major sources of revenue of the government, in Hong Kong, there are many sources associated with property and real estate market. For example, properties and investments, land premium including land sales revenue, granting of land and modification of land leases, stamp duties and rates, etc. Therefore, this show that property market is very important for Hong Kong because of generating large portion of total revenue every year.

3.2 History of Hong Kong's residential property market and the government's measures on curbing real estate speculation

Over the last two decades, Hong Kong has experienced various major events which cause great impact to the property market, including surging of property prices by extensive speculative activities. In this section, history of the Hong Kong property market during 1980s to 2007 and relative government's anti-speculation measures are to be discussed.

3.2.1 In 1980s

During 1981 to 1984, due to the second oil crisis and Sino-British negotiations which causing most of the Hong Kong residents suspicious of political future of Hong Kong after 1997, property price had been largely decreased.

After the Sino-British Joint Declaration in 1984, people became more certain about the future of Hong Kong after 1997 and investors started to restore their confidence in the property market. Until 1987, property market began to greatly expand. Although there were some external factors which caused negative impact to

Hong Kong's property market, it was not being affected seriously and it had been recovered very quickly.

3.2.2 In 1990s

Gulf War was broken out in 1989, but it did not affect the property market of Hong Kong. At the end of the war in 1991, housing prices increased rapidly. Due to the boom of stock market in Hong Kong, people gain more capital for investing in property market too. In addition to the factor of low interest rate (Kong, 1999), this attracted a large number of real-users and speculators buying residential units, especially for those small to medium-sized flats.

Fig.5 and Appendix 1 show the trend of average property prices of Hong Kong during 1986 to 2005. In 1990s, peaks of property prices were occurred in 1994 and 1997 which are as shown in Fig.5 (indicated by red circles). In 1991, 1994 and 1997, the government had intervened the market to curb extensive speculative activities.

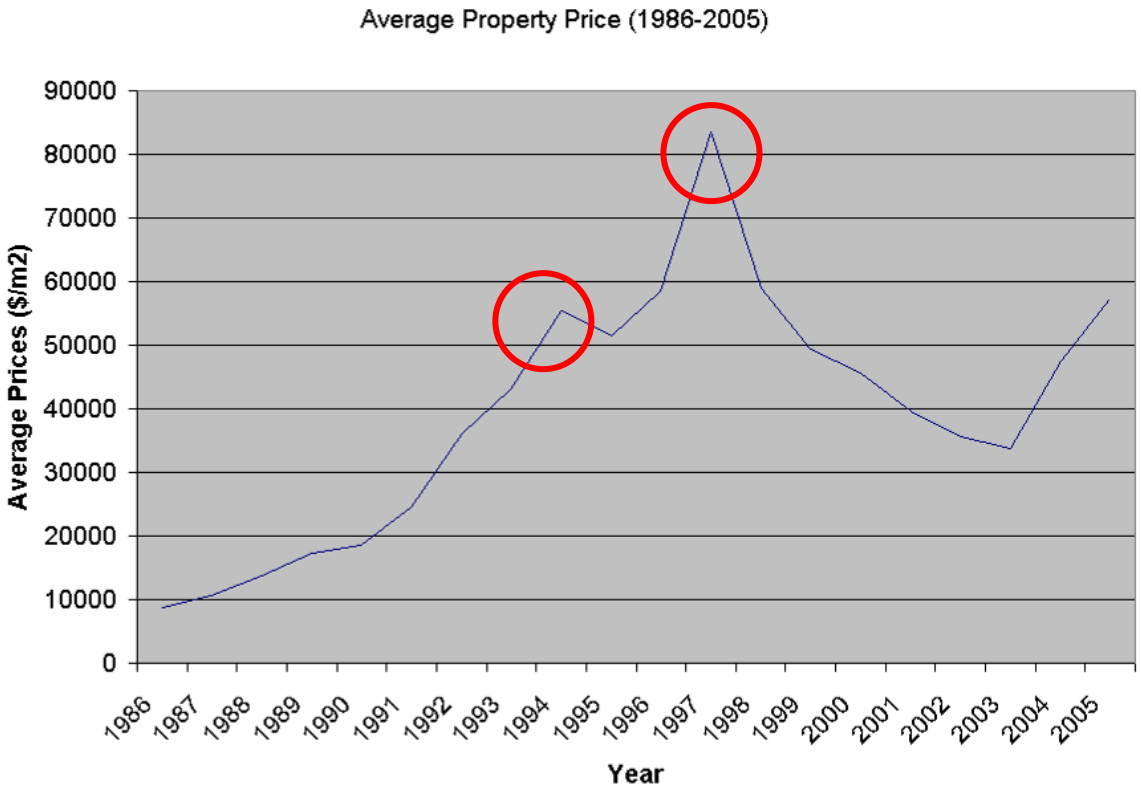

Fig.5 Trend of property prices in Hong Kong (1986-2005)

3.2.2.1 Curbing speculation measures in 1991

Because of great demand of small to medium-sized flats and extensive speculative activities, property prices kept surging. In 1991, the government tried to suppress such a great demand so as to damper quick rising of housing prices.

There were two approaches for curbing extensive speculation. One of the ways was to raise costs of purchase, including tightens mortgage lending policy, imposes

stamp duty on transactions of presale market and profit tax on short-term transferring of residential properties (Ho, 2000). Another way was to control selling of uncompleted flats by the developers in different aspects.

A package of measures was taken in 1991 by the government to curb speculation details was as follows:

a. *"Raising the minimum initial deposit with developers and the forfeiture amount.*

b. *Requiring balloting of registration numbers.*

c. *Allowing only one registration per person during the sale.*

d. *Limiting purchase to one flat per registered person.*

e. *Requiring developers to announce the total number of flats being offered for sale and the number of flats being reserved by them for private allocation when they advertise for the sale."*

f. *Requiring stamp duty to be paid on completion of each and every sale and purchase agreement, rather than on completion of property assignment, except for flats purchased under the Home Ownership Scheme.*

g. *Restricting the private allocation of uncompleted flats by developers to not more than half of the flats for which consent for pre-completion sale is given.*

h. *Imposing restrictions on the timing of resale of privately allocated uncompleted*

flats.

i. *Requiring disclosure of information on all intermediary sales of uncompleted flats.*

j. *Requiring deposits for the purchase of uncompleted flats to be made in bank drafts and not in cheques" (Source: Census and Statistics Department, 1991)*

However, those anti-speculation measures were not effective enough as the property prices were still rising and kept high. Because of increasing of net population inflow (Ho, 2000), include inflow of return migrants, people hired by both local and overseas companies, demand for housing increased and property prices were boosted up further in 1993.

3.2.2.2 Curbing speculation measures in 1994

In order to damper the speculative activities, the government had set up a "Task Force on Land Supply and Property Prices" in 1994. Those policies were aimed to increase the supply of flats and restrict extensive speculation in the presale market. The Task Force Report which was prepared by the Planning, Environment and Land Branch in 1994 had listed out measures for dampening speculation:

a. *"Cut the quota for private sales of uncompleted apartments from 50% to 10% to release up to 10,000 more private domestic apartments directly to home buyers each year.*

b. *Prohibit resale of uncompleted apartments before assignment.*

c. *Restrict forward sale to not more than 9 months before the date of assignment.*

d. *Increase the initial deposit from 5% to 10% of purchase price.*

e. *Raise the amount of forfeiture from 3% to 5% of the purchase price, if the buyer fails to sign a sale and purchase agreement or enters into a cancellation agreement with the developer.*

f. *Make redevelopment projects involving lease modifications and land exchanges subject to building covenant restrictions, which specify completion dates, and to the Consent Scheme which governs the pre-sale of uncompleted apartments.*

g. *Continue to study legislative measures to dampen speculation in the property market. These will include punitive stamp duty on short-term resale of property, penal rating on vacant premises, and the possibility of new legislation to replace the Consent Scheme and embrace the Law Reform Commission's proposal relating to sales descriptions of uncompleted apartments." (Source: Planning, Environment & Land Branch, 1994)*

Those measures were successful on curbing speculative activities since property prices were decreased after implementing of policies. However, prices were climbed up again since 1995 and surging in 1996. The reason is that buyers were trying to escape from the government regulations. Attacking the prohibition of re-selling of uncompleted flats by individuals (Ho, 2000), the buyers setting up companies so as to purchase properties from the developers in the presale market. This situation was even more serious in luxury market[5].

3.2.2.3 Stabilizing housing prices policy in 1997

In order to tackle soaring of the property prices, the government had established a "1997 Policy Programmes" with short-term and long-term strategies for stabilizing the housing prices and providing enough supply for the property market in Hong Kong. This time, the government mainly concerned on increasing the supply of land and housing units so as to meet excessive demand, instead of setting up any policy for curbing speculative activities.

[5] Luxury housing here refers to residential units with size larger than 100 square metres.

Aims for the 1997 Policy Programmes are as follows:

- *"providing a sufficient supply of land, together with supporting infrastructure, for public and private housing;*
- *creating the conditions to enable the private sector to make the fullest possible contribution towards meeting the demand for housing;*
- *implementing subsidized housing schemes to enable those in the relevant income groups to buy their own homes;*
- *providing public housing at reasonable rents to people who cannot afford any other type of housing; and*
- *monitoring the private housing market and, where necessary, introducing measures to curb speculation." (Source: 1997 Policy Programmes, Housing Bureau)*

According to the 1997 Policy Programmes, the programme was not only focused on private housing, but there were six areas in total:

1. *Public Rental Housing;*
2. *Subsidized Home Ownership;*
3. *Financial Assistance for Home Buyers;*
4. *Private Sector Housing;*

5. *Housing Demand and Flat Production; and*

6. *Long term Housing Strategy.*

3.2.2.4 Asian Financial Crisis 1997

Although the property prices had been decreased, increasing of housing supply was not the only reason. In mid-1997, the Asian Financial Crisis, an unremarkable event of the Asian economy, was broken out and affected most Asian countries. By the end of 1997, the stock market of Hong Kong was crashed. This made many people sell their housing properties for covering the losses incurred in the stock market. Since people did not have enough capital for investing housing units, property prices felt down by approximately 40% during the period of 1998. After that, many people were suffering from negative net asset value for many years.

3.2.3 In 2000s

After the Asian Financial Crisis in 1997, under the condition of dropping demand of housing units but large number of supply, property prices had been reduced by approximately two-third over the next several years (Heng Seng Economic Research

Department, 2005). Even though the property market seems to be rebounded in 1999, various events, including 911 terrorists attack in 2001 and outbreak of SARS in 2003, were causing negative impacts to the Hong Kong economy as well as the property market.

Having economic depression for more than five years, the Hong Kong economy started to recover since 2004. In 2005, property prices began to rise gradually. Under the expectation of positive future of property market, this stimulates speculators enter into the property market. During 2006 to 2007, record of the highest transaction prices was broken several times. Those residential units are located in traditional luxury housing districts such as the Peak and Mid-Level.

3.2.4 Curbing speculation measures of the last decade

In order to deal with the sharp rising of property prices and extensive speculation in the property market, the government had taken different kinds of measures for curbing speculation and stabilized property prices in 1991, 1994 and 1997. However, those measures were appeared to be not effective enough to tackle the problems.

There were many criticisms on the government's intervention of the property market. Although speculation drives up property prices and even causes real estate bubble under extensive speculation, speculation improves liquidity in the property market when transaction of sell and buy are not happened at the same time. Based on the idea that speculators solely aim at quick capital gains, Ho and Kwong (2002) suggested two approaches for curbing speculation: administrative measures and profit taxation. Administrative measures, like restriction on transferal of properties in the presale market, could be effective but problem may not be solved due to the lack of restriction in the secondary market. For imposing tax for short-term capital gains, this is effective to suppress speculators' sentiment. However, this may not be effective when there is excessive demand but limited supply of housing. Thus, this should be done only under the situation of adequate supply.

Chapter 4 Classification of residential properties in Hong Kong

This study is going to test whether speculators, who are willing to take higher risks, can enjoy higher returns. Before setting a hypothesis for this research, it is necessary to find out which class can represent speculators and speculative activities are active in. In this chapter, methods of classification of residential units in Hong Kong will be overviewed first which will be followed by selection of method of classification.

4.1 Methods of classification

Residential properties can be classified in terms of location, floor area, floor level, view and layout etc. As to find a type that can represent the type of residential units that speculators are active in, first, we have to investigate how residential units in Hong Kong are classified and choose the best way of classification which is applicable for this research.

In Hong Kong, there are several departments of the government and property

consultant companies providing property market statistics and data regularly, usually monthly or yearly. In providing review and forecast of property market, they classify residential units into different types and provide data for each class. However, their method of classification is different from one and other. In this section, different ways of classification by different departments and companies are introduced. After that, one method of classification will be chosen for this research.

4.1.1 Rating and Valuation Department (RVD)

The Rating and Valuation Department (RVD) of the HKSAR government is one of the government departments that compiles property market statistics in Hong Kong. It provides statistics of property market for domestic and non-domestic sectors. For those domestic statistics which are prepared by the RVD, only private sector developments are considered[6]. The RVD defines "private domestic units" as "independent dwellings with separate cooking facilities and bathroom (and/or

[6] Technical notes 4.3 (2007) from RVD: "Public sector developments, including domestic units built under the Private Sector Participation Scheme for subsidised sale, and all units built under the Home Ownership, Buy or Rent Option, Mortgage Subsidy, Sandwich Class Housing, Urban Improvement and Flat-for-Sale Schemes are not included. Data relating to rental estates built by the Housing Authority and Housing Society, units sold under the Tenants Purchase Scheme, and Government owned quarters are also excluded. Village houses are not included in the stock, completions, demolition, take-up and vacancy figures except for the previous years of 2001 and before as specified."

lavatory)."[7] Unlike the category of private office that are classified into three classes with reference to their quality of finishes and facilities, private domestic units are divided into five classes according to their saleable floor area[8]:

Class A - saleable area less than 40 m^2

Class B - saleable area of 40 m^2 to 69.9 m^2

Class C - saleable area of 70 m^2 to 99.9 m^2

Class D - saleable area of 100 m^2 to 159.9 m^2

Class E - saleable area of 160 m^2 or above

(Source: Rating and Valuation Department Technical Notes 4.2)

The RVD provides data include price indices and rental indices of private domestic market by class, of both the whole territory of Hong Kong ("Territory-wide") and some popular private domestic developments which are selected by the RVD ("Selected Popular Developments"). A list of the "Selected Popular Developments" is given in Technical Note of its respective issues. "Selected Popular Developments" are usually known as large housing estate.

[7] Technical notes 4.2 (2007) from RVD

[8] Technical notes 5.1 (2007) from RVD

4.1.2 Census and Statistics Department (C&SD)

Census and Statistics Department (C&SD) broadly divides residential properties into three types: public rental flats, subsidized sale flats and private flats. Public rental flats and subsidized sale flats are provided by the Hong Kong government. In this dissertation, only private residential housing is considered, so only statistics of private flats is applicable to this research. However, there is no further classification of private flats for the C&SD.

4.1.3 Private sector

In Hong Kong, many worldwide property consultant companies or agencies provide a wide range of real estate research including property market statistics and including price indices for Hong Kong's property market. For example, CB Richard Ellis Hong Kong, Colliers International (Hong Kong) Limited and Centaline Property Agency Limited.

For those property consultant companies, they broadly divide residential housing into two types: luxury housing and non-luxury housing. Some of them only provide

statistics for luxury housing only. They define luxury housing by districts. For example, according to “Hong Kong Market Index Brief – Luxury Residential Properties” of the CB Richard Ellis Hong Kong (CBRE), they only consider four districts: Jardine’s Lookout/Tai Hang, Island South, Mid-levels and the Peak. However, their classification is not consistent with that of other companies. The Colliers International (Hong Kong) Limited provides key market indicators for luxury residential market. They also define luxury housing by districts but some luxury residential properties in North Point are included in their research. Thus, it is not accurate enough to define luxury housing solely by districts.

The Centaline Property Agency Limited has established price indices, “Centa-City Leading Index” (CCL) and “Centa-City Index” (CCI), for property market in Hong Kong. CCL is a weekly index while CCI is a monthly index. Unlike the RVD, the Centaline divide residential housing into four classes by districts: Hong Kong Island, Kowloon, New Territories (East) and New Territories (South). They define luxury housing by selecting some housing estate, which is similar to the “Selected Popular Development” form the RVD.

4.1.4 Summary of different methods of residential housing's classification

Table 4 summarizes how residential units are classified by different departments of the government and property consultant companies:

	Method of classification	Categories
HKSAR Rating and Valuation Department (RVD)	By saleable floor area 1. "Territory-wide" 2. "Selected popular development"	1. Class A 2. Class B 3. Class C 4. Class D 5. Class E
HKSAR Census and Statistics Department (C&SD)	By flat types	1. Public rental flats 2. Subsidized sale flats 3. Private flats
Other private property consultant or agency companies, e.g.		
Centaline Property Agency Limited	By districts 1. whole territory 2. selected housing estates	1. Hong Kong Island 2. Kowloon 3. New Territories (East) 4. New Territories (South)

CB Richard Ellis Hong Kong (CBRE)	1. Luxury housing (by district) 2. Mass residential housing	1. Jardine's Lookout/Tai Hang 2. Island South 3. Mid-levels 4. The Peak

Table 4 Summary of the classifications of housing

4.2 Selection of method of classification

The criteria for choosing which method of classification is the best for this research include availability of data collection, considering all types of housing in the residential property market, existence of one class that could represent the housing type that speculators would active in.

As mentioned before, there is no further classification of private flats for the C&SD. Therefore, their method of classification is not applicable for the research.

For most private property consultant and agency companies, they classify residential units by district, selected housing estate and/or luxury housing. Classifying

by district can not be a method to find a district where speculative activities are active in. Since there are different types of residential housing in one district, in addition, speculators would not only speculate in one district, this is not possible to find particular districts that can represent where speculators are largely being involved.

By considering of whether private housing is selected housing estate and luxury housing. This method not accurate enough since the way of selection of housing estate and luxury housing by different private property companies are not the same. In Hong Kong, there is no standard for defining and classifying luxury housing, it is up to those private property consultant companies to decide what is regarded as luxury housing. Therefore, data they provide are not consistent with one and other. Hence, it is difficult to find a class that can represent speculation.

Among classification of residential units by location, quality and floor area, by considering availability of data and representable for speculators, classification by floor area would be a better method for classification. Since the RVD divides residential housing into five housing classes by saleable floor area, each class represent a range of saleable floor area. By considering “whole territory” and classifying by floor area, the problem of inconsistency on data collection by

classifying in district and quality of housing can be avoided. Furthermore, class representing speculators can be found in the later part based on characteristics of speculators which has been mentioned in the previous part. Therefore, method of classification by the RVD in form of saleable floor area is used for this research.

Chapter 5 Hypothesis, Methodology and Data

In this chapter, I am going to study which class the speculators would be active in under the feature that they are willing to take higher risk for higher return. A hypothesis will be deduced at the end of this chapter. Followed by the explanation of the hypothesis, methodology and data specification will also be introduced.

5.1 Hypothesis deduction

5.1.1 Theoretical analysis

Rational people would invest in assets which can generate the highest rate of return. At the same time, they have to consider the risk and try to minimize it. Among the five housing classes, which class are the speculators most investing actively in? Under what conditions they would focus on speculating on that class?

The higher the return they want to gain, the higher the risk they have to take. What is the reason behind that makes the speculators become a risk-lover? If the rate of return per unit of risk for each class is equal, why don’t they speculate in the class

with the lowest risk? The obvious reason is that they can take the biggest advantages and returns from the most risky class especially when the risks are keeping constantly.

The “supply and demand” is a big issue for the speculators; it can interfere the speculators’ decision making and also influent the whole situation of the residential property market in Hong Kong. Different supply and demand models of different classes are going to be demonstrated.

On the supply side, residential units are supplied by sellers in primary and secondary market. In primary market, developers sell new residential units. Due to long construction time for residential properties, the supply of new residential properties is very inelastic and even close to perfectly inelastic (S_p). Inelastic refers to the change of price, which is much greater than the change of quantities. In secondary market, sellers are real-users, investors and speculators instead of developers. The supply of residential units is much more elastic (S_s) because no construction time is required. The aggregate supply cure (S_a) in-between the supply curves of primary and secondary market is shown in Fig.6.

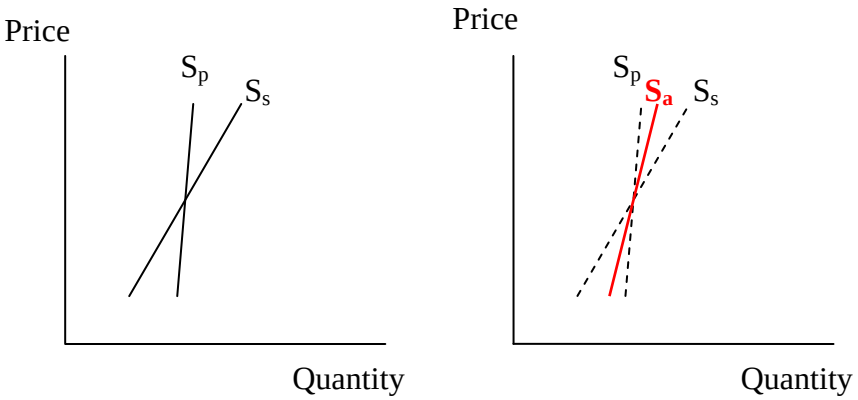

Fig.6 Supply curve of residential property market

On the demand side, it is most likely affected by the purchasers of the residential properties. They are the real-users, the investors or the speculators and they form an aggregate demand curve. According to the law of demand, if the demand is increasing and the supply is keeping in a constant, then the overall prices are increased. It is assumed that speculators can anticipate future prices more accurately than real-users and investors.

Compared with other purchasers, the reactions of speculators toward the market condition are very fast. The reason is that real-users and investors have to collect the information of properties where they are going to buy, including the inspection of the residential units and compare market prices of different units. For speculators, they need not to do so and they can analyze the information of property market within a

short time since they are the experts. One major effect of speculation is driving up of property prices. When speculators enter into the market and attract other buyers, number of purchaser and the demand will be increased. As a result, the property price is boost up to a high level.

Due to liquidity, the higher the housing size, the lower the elasticity. By comparing the elasticity of supply within the five housing classes, Class E has the lowest liquidity and it takes more time on searching the buyers, thus, the supply of Class E is very inelastic (S_E). Under this condition, Class E is only a small portion of mass residential market and speculators can dominate Class E market and drive up the price more easily than in other classes ($S_{A,B,C,D}$). (Fig.7)

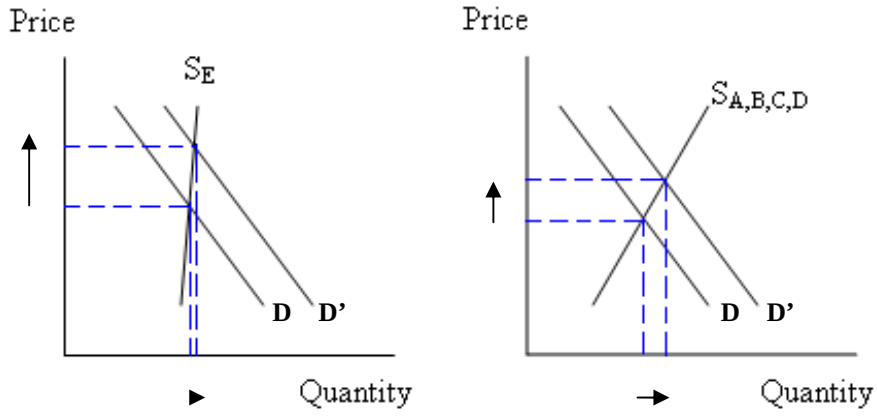

Fig.7 Supply and demand models of Class E and other classes

In this case, risk-adjusted returns of different classes are compared. If risk-adjusted returns of Class E are higher than of the other classes, this implies that Class E result in excess returns even when the risks are keeping constantly, and speculators would largely be involved in Class E than the other classes.

5.1.2 Hypothesis

As mentioned in Chapter 2.4.2, Sharpe Ratio is a very popular and commonly used for the risk-adjusted returns measurement which is developed by William Forsyth Sharpe. It is chosen as risk-adjusted returns measurement for this dissertation and the hypothesis developed for this research is:

"Class E has the highest Sharpe Ratio"

$$S_E > S_{A,B,C,D}$$

5.2 Methodology

5.2.1 Sharpe Ratio

When comparing the Sharpe Ratio among the five classes, Sharpe Ratio for each class has to be calculated. Sharpe Ratio is a risk-adjusted ratio, which is expected return minus risk-free rate and then divided by standard deviation of risk minus risk-free rate. Expected rate of return is product of weight and rate of return, since weight equals to one when calculating rate of return for each class, expected return is same as return.

$$S = \frac{E[R - R_f]}{\sigma} = \frac{E[R - R_f]}{\sqrt{\text{var}[R - R_f]}}$$

$$E(R) = \sum_{i=1}^{N} (w_i \times R_i)$$

Where S: Sharpe Ratio

R: Rate of return

R_f: Risk-free rate

σ : Standard deviation of ($R-R_f$)

w: Weight

For rate of return, it is better to use logarithmic rate of return ($R_{(t+1)log}$) instead of using arithmetic rate of return. Logarithmic return is symmetric, positive and negative returns are equal in magnitude. It is calculated by taking natural log of price of time

t+1 (P_{t+1}) over price of time t (P_t):

$$ROR_{(t+1)_{\log}} = \ln\left(\frac{P_{t+1}}{P_t}\right)$$

By considering risk-free rate are changing with time, the revised version of Sharpe Ratio (1994), which is less widely used, rather than the original one (1992) is used. After subtracting risk-free rate from rate of return and find out their standard deviation, Sharpe Ratio of different classes can be worked out.

5.2.2 t-Test

After working out the rate of return and Sharpe Ratio of the five classes, Student's t-test with sample sets of Classes A, B, C and D with respect to Class E will be carried out separately. This is used to check the significant levels of the results so as to see whether those differences are due to the real differences of the samples.

The t-Test was firstly be introduced by a statistician, William Sealy Gosset, in 1908. The t-Test was named as "Student", which is Gosset's pen name. The t-Test is regarded as a hypothesized statistical test where populations are normally distributed under the condition that the null hypothesis is true. The null hypothesis is the mean of

the normal distributions of the two tested samples are equal. This is used to test whether means of the two distributions are different provided that they are assumed to be normal distributed. p-value is known as the probability that the hypothesis would be rejected. If the p-value calculated is less than 5% (or 0.05), which is a common threshold for statistical significance. Then we can conclude that the difference is real and distinct.

There are different versions of t-test, depending on whether they are independent or dependent, one sample or two samples, equality of sample size and variance. For this research, the “independent two-sample test assuming unequal variances” is chosen.

5.3 Data specification

Rating and Valuation Department provides property market statistics monthly and also publishes journal, “Hong Kong Property Review”, annually, in both hardcopy and electronic format. Most of the property market statistics can be retrieved from the official website of the Rating and Valuation Department. Therefore, the source of data showing in this dissertation is mainly quoted from the RVD’s website and annual journals.

The RVD provides property market statistics by four different property types: “Private Domestics”, “Private Office”, “Private Retail” and “Private Flatted Factories”. For each property type, rental and price indices are provided. The scope of this study is focused on the sales market of the private residential housing, therefore only the price indices of “Private Domestics” will be considered.

Price index is a kind of numerical measurement which is used for comparing prices of classes within different time periods. According to the Technical Notes 13 (Appendix 2), price indices are “derived from the same data that are used to compile average prices. The indices measure value changes by reference to the factor of price

divided by ratable value of the subject properties rather than by reference to the price per square metre of floor area."

Under the "Private Domestic" section, the RVD provides rental and price indices by class for both "territory-wide" and "selected property development". Some residential units can be a single block or an apartment, a duplex or a detached house, etc. For any data of housing extracted from the Selected Popular Developments that are not listed in the housing estate will be excluded from this research. Due to this reason, data from price indices of "territory-wide" instead of "selected property development" will be chosen for this study.

In addition, the RVD provides monthly, quarterly and annual indices. "Quarterly and annual indices are the simple average of the monthly indices in respect of the relevant period" (Technical Notes 13.5). Therefore, using data of monthly indices for the study would be more accurate.

5.3.1 Time frame

The RVD provides the latest monthly market statistics as well as historical data of different market statistics. Concerning the availability of data, monthly price indices is available for the year of 2007, there are also monthly price indices from 1993 to 2006 under the historical data. Hence, the time frame to be considered is started from 1993 to 2007. The RVD provides historical data as early as 1979. However, there are only quarterly and annual indices available for 1979 to 1992. Time period from 1979 to 1992 will not be taking into account.

5.3.2 Risk-free rate in Hong Kong

Risk-free rate is known as the interest rate that can be obtained from investment without any risk. Risk-free rate can only exist in theory because there are no risk-free financial instruments and there must be at least a small amount of risk. In practice, interest rate on government bonds is regarded as a risk-free rate. For example, interest rates on U.S. Treasury Bill are often used as risk-free rate.

However, the government of Hong Kong does not issue any government bonds. In Hong Kong, Exchange Fund Bills, which is issued by Hong Kong Monetary Authority (HKMA), are considered as a risk-free rate. Thus, Exchange Fund Bills are used as risk-free rates for this research.

Yield of the Exchange Fund Bills from 1991 to 2007 can be obtained from "Monthly Statistical Bulletin" of the website of HKMA, acting as a source for collecting data of risk-free rate. There are Exchange Fund Bills with different maturities: 7-day, 30-day, 91-day, 182-day, 273-day, and 364-day. Which type of Exchange Fund Bills should be chosen as the risk-free rate for calculating Sharpe Ratio?

The research is focused on speculators, who are also known as short-term investors where short-term means not more than 2 years. As to choose a type of Exchange Fund Bills which is more comparable with rate of return for this research, transaction data of repeated transactions in Hong Kong during 2005 and 2006 are collected from the EPRC in order to find out the average period that the short-term investors hold and sell. Exchange Fund Bills with maturity closes to the average period will be chosen as risk-free rate for calculation. From the transaction data in the

EPRC, it is found that the average period is approximately 6 months. Therefore, data of Exchange Fund Bills (182-day) will be used.

The data of Exchange Fund Bills given are annual rates and therefore it is divided by 12 as a monthly basis, which is at the same basis as the rate of returns. (Appendix 3)

Chapter 6 Result and result analysis

In this chapter, results of the test will be illustrated and the reasons for the tested outcomes will be discussed. Finally, validation of hypothesis on whether it is accepted or rejected will be concluded.

6.1 Results of testing

Data of price indices of different classes (territory-wide) is collected from the "Hong Kong Property Review" published by the Rating and Valuation Department (Appendix 4). Fig.8 shows graph of price indices of the five classes:

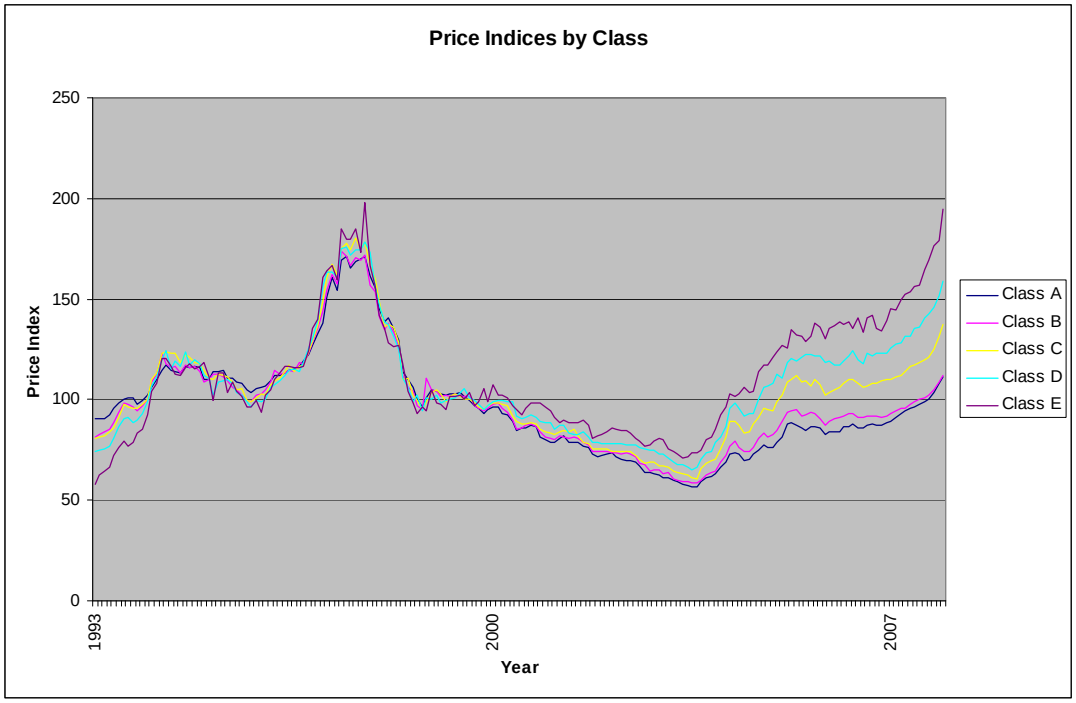

Fig.8 Graph of price indices of 5 classes

The logarithmic rate of return of the five classes is calculated and as shown in Appendix 5. Average of logarithmic rate of return for the five classes are shown as below:

Class	A	B	C	D	**E**
Average log. ROR (Correct to 2 d.p.)	0.12%	0.18%	0.30%	0.42%	**0.68%**

Table 5 Average logarithmic return of 5 classes

Price volatility is calculated by standard deviation of logarithmic rate of return of the five classes. Data of price indices of different classes is collected which is as shown in Appendix 5. Standard deviation of different classes is calculated and result is as follows:

Class	A	B	C	D	**E**
Price volatility (SD of ROR) (Correct to 2 d.p.)	2.90%	3.40%	3.48%	3.67%	**4.83%**

Table 6 Price volatility of 5 classes

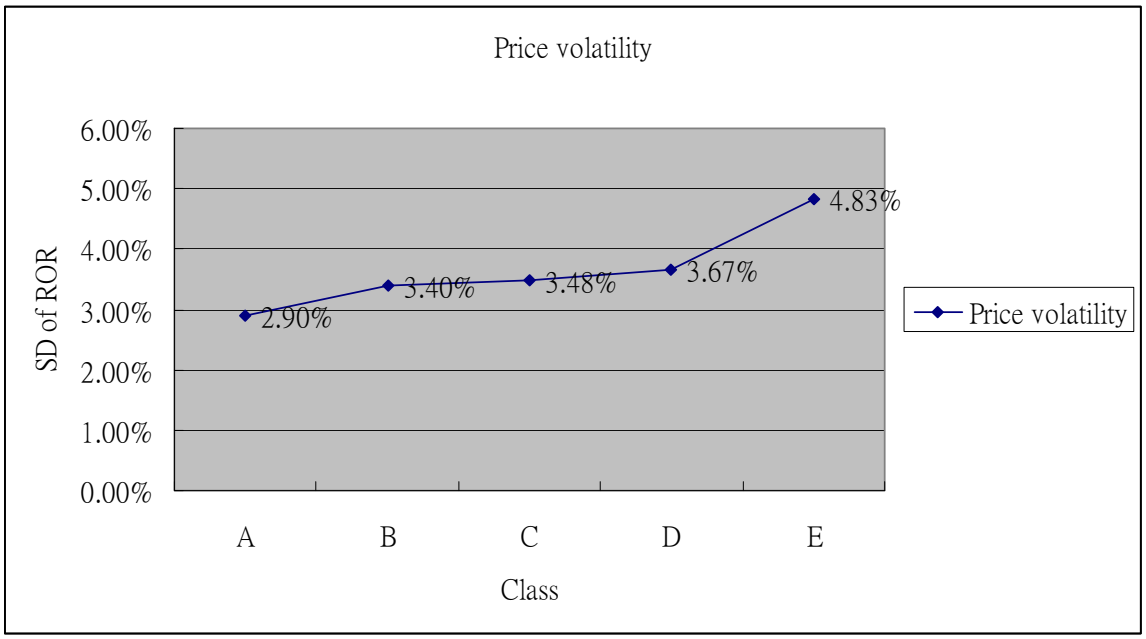

Fig.9 Graph of price volatility of 5 classes

The class with the highest standard deviation represents class with the highest price volatility. Table 6 and Fig.9 show that Class E has the highest standard deviation of rate of return which is 4.83%, while standard deviation of other classes are much lower and closer to each other (from 2.90% to 3.67%) when compared to Class E (4.83%).

By comparing the relationship between risks and returns of Class E with that of other classes, from the results calculated in Chapter 4.2 (Table 7 and Fig.10), it is shown that rate of return (ROR) increase as the risks (price volatility) increase:

Class	A	B	C	D	E
Average log. ROR (Correct to 2 d.p.)	0.12%	0.18%	0.30%	0.42%	0.68%
Price volatility (SD of ROR) (Correct to 2 d.p.)	2.90%	3.40%	3.48%	3.67%	4.83%

Table 7 Risk and return of 5 classes

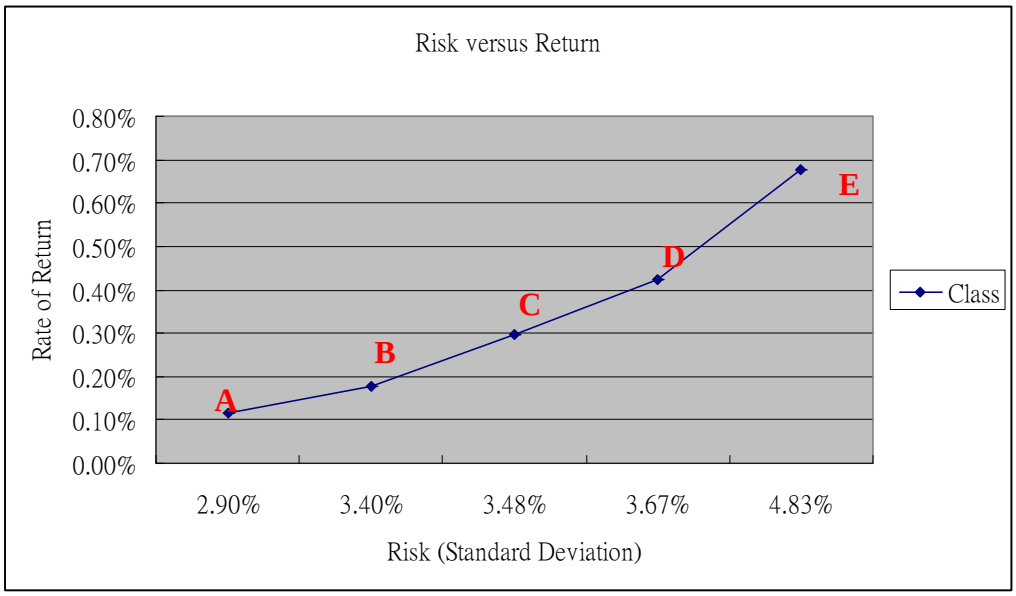

Fig.10 Graph of risk versus return

This shows that investors can gain a higher return when they take a higher degree of risk. However, what is the case when keeping risks being constant? Will Class E still obtain a higher return than other classes? In this case, Sharpe Ratio of different classes is compared. Details of calculation can be referred to Appendix 6 and results of Sharpe Ratio are as shown in Table 8 and Fig.11:

Class	A	B	C	D	E
Average (R-Rf) (Correct to 2 d.p.)	-0.22%	-0.16%	-0.04%	0.09%	0.34%
SD of (R-Rf) (Correct to 2 d.p.)	2.96%	3.46%	3.55%	3.73%	4.89%
Sharpe ratio (Correct to 4 d.p.)	-0.0753	-0.0466	-0.0119	0.0228	0.0689

Table 8 Sharpe Ratio of 5 classes

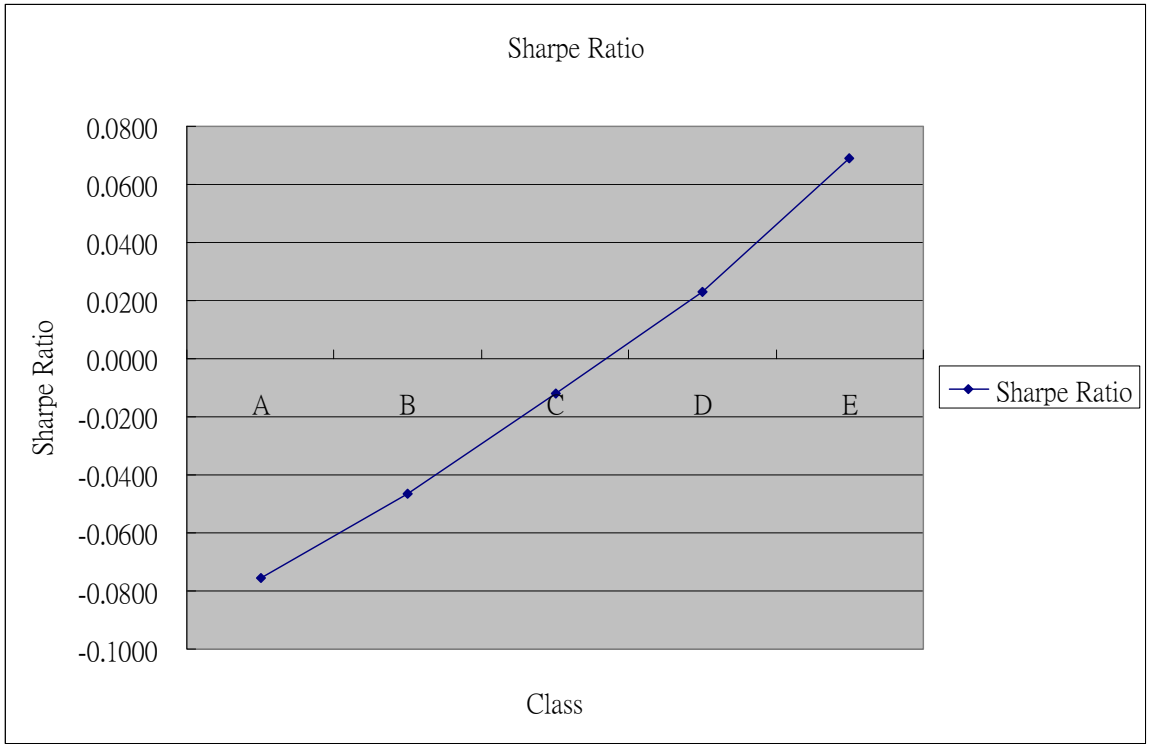

Fig.11 Graph of Sharpe Ratio of 5 classes

Class E has the highest Sharpe Ratio (0.0689) whereas Class D is the second highest (0.0228). For Classes A, B and C, their Sharpe Ratio is negative: -0.0753, -0.0466 and -0.0119 respectively. From Fig.9, it can be observed that Class E has a non-proportional higher Sharpe Ratio than other classes. The higher the housing class (housing size), the higher is the Sharpe Ratio, and hence, the higher the risk-adjusted return.

To sum up, testing of the hypothesis result in the following observations:

1. Class E has the highest the price volatility, and it results in the highest rate of return.
2. Class E has the highest Sharpe Ratio and it has a non-proportional higher Sharpe Ratio than other classes.
3. Classes A, B and C have negative Sharpe Ratio.

Reasons behind for each outcome will be discussed in the next section.

6.2 Analysis of result

6.2.1 Class E has the highest the price volatility, and the highest rate of return

Class E is the most risky class with the highest level of price volatility. In addition, the higher the housing class, the higher is the price volatility. It is simply because of its large housing size which results in high total consideration. Compared to other classes, Class E purchasers are required to pay a higher down payment for buying the residential units. This is known as liquidity risk. The higher is the risk to be taken, the higher is the return can be gained. Therefore, Class E has the highest rate of return.

6.2.2 Class E has the highest and a non-proportional higher Sharpe Ratio

Investors can gain a higher return when they are willing to invest in more risky assets. They can gain the highest return by investing in Class E since it has the highest risk. For this reason, by keeping risk constant, the risk-adjusted return for the five classes should be the same. However, the result in Table 5 shows that Sharpe Ratio of the five classes is different. Fig.4 shows an upward-sloping curve instead of a

horizontal line. What are the reasons that Class E investors enjoy non-proportionally high risk-adjusted return?

6.2.2.1 Supply of Class E housing is inelastic

As mentioned in Ch. 5.1, supply of Class E is more inelastic than other classes. Since that supply of land is limited by the government and the development potential control such as plot ratio is restricted under statutory, it is difficult for the developers to find a desire place for building Class E housing. Even when there is an excess demand on Class E residential units, developers are not able to react quickly on increasing supply because this takes time for construction and it is not easy to increase supply within a short period.

Location is an important factor for determining value of residential units. Besides, there are also many other factors affecting the property value, such as age of housing, view and height. Due to the limited supply, most Class E housing is built in prestige location, like the Peak and Mid-levels. The reason is that Class E can be resulted in a higher profit margin by incorporating other superior features. Thus, by comparing Class E with other classes, location is a factor much more important to Class E while

other factors are less significant.

Class E is a relatively small and a limit market so that speculators are easier to dominant the Class E market and control the demand and supply of Class E housing. Therefore, people can gain an excess return by investing in Class E.

6.2.2.2 Liquidity premium

Class E investment is less liquid than other classes because of its larger flat size. Purchasers of Class E housing have to pay a greater amount of down payment as well as monthly installments. Because of involving the large involve of money, people may not have enough capital for investing Class E housing, it is more difficult and takes more time for them to sell and find other buyers. Thus, Class E is the most illiquid class.

Liquidity premium can be gained by investing a less liquid asset. Liquidity premium is regarded as difference of two assets with similar properties but with different liquidity. It acts as a compensation for investors to invest in a less liquid asset.

Liquidity premium and risk premium are the major components of rate of return. After keeping risk constant by using Sharpe Ratio, speculators can still earn an excess return, liquidity premium, for investing in Class E. For the less liquid property, it is more difficult to sell, so it results in higher return.

6.2.2.3 Limit market

Since that the stock of Class E is far less than other classes, it is considered as a limit and small market. It is more difficult to find comparables for valuing a Class E residential unit, especially for the unit with special features like swimming pool or garden. Compared with other classes, Class E market is the least being affected by economic fundamentals of the local market. When there is an economic downturn in the local economy, property prices of Class E would be decreased less than other classes.

6.2.3 Classes A, B and C have negative Sharpe Ratio

Under a condition that rate of return of an asset is smaller than risk-free rate, this result in negative return and hence negative Sharpe Ratio. In theory, negative Sharpe

Ratio exists and it means that the asset is under performing than the risk-free asset. However, in practice, negative Sharpe Ratio is impossible. If investors can only gain a negative return for those assets with negative Sharpe Ratio, no one will invest in those assets, because it is even worse than saving money in the bank. But why does negative Sharpe Ratio exist in reality? And in this study, why do Classes A, B and C having a negative Sharpe Ratio?

Same principle of negative real interest rate[9] is applied here for the explanation of negative Sharpe Ratio. From the opinion of Dr. C.Y. Edward Yiu, negative Sharpe Ratio occurs because of error of Sharpe Ratio, which is acting as a testing tool. Once again, the main focus of this test is finding whether Class E has the highest Sharpe Ratio among the other classes. The result had shown a clear comparison of different classes' Sharpe Ratio. Therefore, whether those Sharpe Ratios are positive or negative is not a great concern for this test.

[9] Hong Kong is implementing linked exchange rate system. When the interest rate of US decreases, due to the linked interest rate, the interest rate of HK has to be decreased as well. At the same time, the inflation rate in Hong Kong is largely depended on domestic demand and is affected by the two largest trading partners, the Mainland China and the US. As a result of the rising of trading partners' inflation rate together with the decreasing of the interest rate, the inflation rate of Hong Kong is increasing at a fast rate and keeping in a high level. This leads to instability of economic and finance of the local market. Under the condition of low interest rate and high inflation rate, negative interest rate is occurred, even though it is impossible to have negative interest rate in theory.

6.3 Results of t-test

Details of t-test results of different classes with Class E are compared as below:

6.3.1 t-Test of Rate of Return

Data set (in Rate of Return (ROR))	**Class A & Class E**	**Class B & Class E**	**Class C & Class E**	**Class D & Class E**	
Class	Class A (ROR)	Class B (ROR)	Class C (ROR)	Class D (ROR)	Class E (ROR)
Mean	0.00116	0.00178	0.00297	0.00425	0.00676
Variance	0.00084	0.00116	0.00121	0.00135	0.00233
Observations	179	179	179	179	179
Hypothesized Mean Difference	0	0	0	0	
df	292	320	324	332	
t Stat	-1.33005	-1.12800	-0.85149	-0.55471	
P(T<=t) one-tail	0.09227	0.13008	0.19756	0.28973	
t Critical one-tail	1.65011	1.64964	1.64958	1.64946	
P(T<=t) two-tail	0.18454	0.26017	0.39513	0.57947	
t Critical two-tail	1.96815	1.96743	1.96734	1.96713	

Fig.12 t-Test of Rate of Return: Two-Sample Assuming Unequal Variances

6.3.2 t-Test of Risk Premium

Data set (in risk premium (R-Rf))	**Class A & Class E**	**Class B & Class E**	**Class C & Class E**	**Class D & Class E**	
Class	Class A (R-Rf)	Class B (R-Rf)	Class C (R-Rf)	Class D (R-Rf)	Class E (R-Rf)
Mean	-0.00223	-0.00162	-0.00042	0.00085	0.00337
Variance	0.00088	0.00120	0.00126	0.00139	0.00239
Observations	179	179	179	179	179
Hypothesized Mean Difference	0	0	0	0	
df	293	321	325	333	
t Stat	-1.31092	-1.11289	-0.83922	-0.54704	
P(T<=t) one-tail	0.09545	0.13330	0.20098	0.29236	
t Critical one-tail	1.65007	1.64963	1.64956	1.64944	
P(T<=t) two-tail	0.19091	0.26659	0.40196	0.58472	
t Critical two-tail	1.96809	1.96740	1.96729	1.96711	

Fig.13 t-Test of Risk Premium: Two-Sample Assuming Unequal Variances

For the one-tail test of rate of return and risk premium between Class A and Class E, the p-values are 0.092 and 0.095 respectively. Therefore, it is around 10% significant level and around 90% confident that there are real differences.

6.4 Hypothesis testing

For this study, the hypothesis is “Class E has the highest Sharpe Ratio”. From the results and the results analysis, these show that Sharpe Ratio of Class E is higher than all other classes. From the results of t-test, it is concluded that there are real differences between means of rate of return and Sharpe Ratio between Class A and Class E. Therefore, it is proved that the hypothesis is accepted.

Chapter 7 Conclusion

In this chapter, summary and implications of the study will be presented. Followed by limitations of the study, recommendations on further study will be made.

7.1 Summary and implications of the study

The aim of this study is to examine appropriateness of laymen's perspective on speculators. The study has been focused on speculators in the residential property market of Hong Kong. By looking back on the history of Hong Kong's property market, it is found that property market plays an important role in the Hong Kong's economy and extensive speculative activities have a great impact, both positive and negative, on the property market.

Different literatures of speculators have been reviewed and it is found that there are many definitions of speculators. Some of them are quite ambiguous since description of some features of speculators is quite similar to that of investors. However, generally, speculators can be distinguished from investors in terms of their willingness of risk-taking, investment horizon and objectives of investment.

Compared to other buyers in residential property market, speculators are more willing to take higher risk, their period between hold and sell is shorter and they are only aimed at capital gains instead of own occupation of residential units.

There are many arguments concerning whether speculation helps stabilize or destabilize the market. In theory, speculators help stabilizing the market since they buy at low and sell at high. However, extensive speculation creates speculative bubbles which causing high price volatility and result in destabilization of market. For some countries, the government would intervene the market as to stop extensive speculative activities. In the last decade, the Hong Kong government had intervened the property market 3 times by imposing various policies to curb speculation. However, those measures were not effective enough to curb speculation and stabilize property prices.

Residential units can be classified by location, housing size and quality etc. By considering standard of classification and data availability in the property market, housing size has been chosen as a method of classification for the study. Due to the most inelastic supply and highest level of liquidity risk, Class E represents the most risky housing class. As refer to the definition of speculators that they are willing to

take higher risk, Class E buyers are regarded as speculators. As to test the validity of the definition of speculators, it has been tested whether Class E buyers can enjoy higher risk-adjusted return.

By considering price indices of different class, it has been shown that Class E has the highest price volatility. The larger the housing size, the higher is the risk, and therefore, the higher is the return. Hence, Class E also has the highest rate of return. However, by calculating different classes' Sharpe Ratio, a risk-adjusted return measure, Class E still enjoys a higher return. Reasons for Class E enjoying higher risk-adjusted return include inelastic supply of Class E, liquidity premium and limit market of Class E.

The hypothesis of the study, Class E has the highest Sharpe Ratio, has been proved to be accepted. The study has shown that it is appropriate to define speculators as short-term investors which are willing to take higher risk for higher return. Return here means rate of return with and/or without adjustment of risk.

7.2 Limitations of the study

The major limitation of the research is classifying residential units by housing size. It is known that there are many ways for classifying residential units. Speculators would buy residential units by considering their locations, sizes, view and quality, etc. Housing size is not the only way for classification and Class E, class with the largest housing size, can not be absolutely represent speculators. According to lots of newspaper reports, different private property consultant and agency companies, luxury housing is usually being used as a term for describing speculative class. However, they have different standards to define luxury housing and data provided are relatively limited, the term luxury housing can not be used for representing speculators in this research. Therefore, housing size has been chosen and acting as a proxy for the study.

7.3 Recommendations on further study

7.3.1 Presale market

This research has been focused on speculative activities of the spot market. In Hong Kong, speculative activities are much more extensive in the presale market. Therefore, further study can focus on the effect of speculation on property prices in the presale market.

7.3.2 Luxury housing sector

Most people agree that speculators are active in luxury housing. However, in Hong Kong, there is no standard for classify luxury housing and it has not been clearly define. Thus, housing size has been chosen as proxy for the study. For further study on speculative activities, it is suggested to clarify luxury housing in a more precise and definable way.

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Appendix 1

Average Property Prices ($/m^2) in Hong Kong (1986-2005)

Year	Average Price ($/m^2)	Rate of increase(+)/ decrease(-)
1986	8844	-
1987	10674	20.69%
1988	13771	29.02%
1989	17214	25.00%
1990	18468	7.28%
1991	24491	32.62%
1992	36124	47.50%
1993	43204	19.60%
1994	55336	28.08%
1995	51372	-7.16%
1996	58558	13.99%
1997	83599	42.76%
1998	58880	-29.57%
1999	49333	-16.21%
2000	45530	-7.71%
2001	39633	-12.95%
2002	35657	-10.03%
2003	33717	-5.44%
2004	47400	40.58%
2005	57320	20.93%

(Source: Rating and Valuation Department)

Appendix 2

Technical Notes of *Hong Kong Property Review 2007*, Rating and Valuation Department, Hong Kong SAR Government

1. 報告年度

每年出版的《香港物業報告》描述上一個曆年本港物業市場活動，並預測隨後兩年的落成量。

1. Review Period

Each issue of the Hong Kong Property Review presents the property market activities in the preceding calendar year, with forecasts of completions for the succeeding two years.

2. 範圍

本報告的調查對象涵蓋全港私人樓宇。

2. Scope of the Review

The Review covers private building developments throughout the territory.

3. 區域及地區

本報告把港島、九龍及新界按區議會的選區分界劃分為18個地區，詳情見於附錄及分區圖。寫字樓類別加插了分區，以便就主要的寫字樓區進行更詳細分析。

3. Areas and Districts

The areas of Hong Kong Island, Kowloon and New Territories are divided into 18 districts as shown in the Appendix and on Plans 1 and 2. The boundaries of these districts follow those of the 18 District Council Districts. For the office sector, there is further sub-division into certain sub-districts, to enable more detailed analysis of the principal office districts.

4. 物業類別

4.1 樓宇一般是按佔用許可證（俗稱入伙紙）上註明的用途分類，除非本署得悉樓宇其後在結構上有所更改。本署沒有特別調查樓宇現時的用途，也沒有嘗試辨別哪些住宅樓宇是用作非住宅用途，或哪些非住宅樓宇是用作住宅用途。

4. Property Types

4.1 Premises are categorised according to the use for which the occupation permit was originally issued, unless known to have been subsequently structurally altered. Otherwise, no specific check is made on current use and no attempt has been made to distinguish those domestic units used for non-domestic purposes and vice versa.

4.2 私人住宅單位，是指各自設有專用的煮食設施和浴室（及／或廁所）的獨立居住單位，並按樓面面積細分如下：

A類單位－實用面積少於40平方米
B類單位－實用面積為40至69.9平方米
C類單位－實用面積為70至99.9平方米
D類單位－實用面積為100至159.9平方米
E類單位－實用面積為160平方米或以上

4.3 本報告並不包括所有公共房屋發展計劃，如私人機構參建居屋計劃的資助出售住宅單位、居者有其屋計劃、可租可買計劃、重建置業計劃、夾心階層住屋計劃、市區改善計劃和住宅發售計劃的全部單位的統計數字。房屋委員會與房屋協會興建的出租屋邨、租者置其屋計劃下售出的單位，以及政府所擁有的宿舍資料，亦不包括在本報告內。樓宇總存量、落成量、拆卸量、入住量及空置量的數字並不包括村屋在內，惟2001年或以前特別指明的資料除外。

4.4 私人寫字樓包括商用樓宇內的物業，但不包括綜合用途樓宇內的非住宅用途單位。寫字樓分為以下各級：

甲級 － 新型及裝修上乘；間隔具彈性；整層樓面面積廣闊；大堂與通道裝潢講究及寬敞；中央空氣調節系統完善；設有良好的載客及載貨升降機設備；專業管理；普遍有停車設施。

乙級 － 設計一般但裝修質素良好；間隔有彈性；整層樓面面積中等；大堂面積適中；設有中央或獨立空氣調節系統；升降機設備足夠；管理妥善；不一定有停車設施。

4.2 Private Domestic units are defined as independent dwellings with separate cooking facilities and bathroom (and/or lavatory). They are sub-divided by reference to floor area as follows :

Class A - saleable area less than 40 m^2
Class B - saleable area of 40 m^2 to 69.9 m^2
Class C - saleable area of 70 m^2 to 99.9 m^2
Class D - saleable area of 100 m^2 to 159.9 m^2
Class E - saleable area of 160 m^2 or above

4.3 Public sector developments, including domestic units built under the Private Sector Participation Scheme for subsidised sale, and all units built under the Home Ownership, Buy or Rent Option, Mortgage Subsidy, Sandwich Class Housing, Urban Improvement and Flat-for-Sale Schemes are not included. Data relating to rental estates built by the Housing Authority and Housing Society, units sold under the Tenants Purchase Scheme, and Government owned quarters are also excluded. Village houses are not included in the stock, completions, demolition, take-up and vacancy figures except for the previous years of 2001 and before as specified.

4.4 Private Office premises comprise premises situated in buildings designed for commercial/ business purposes. Excluded are non-domestic floors in composite buildings. Offices are graded as follows :

Grade A - modern with high quality finishes; flexible layout; large floor plates; spacious, well decorated lobbies and circulation areas; effective central air-conditioning; good lift services zoned for passengers and goods deliveries; professional management; parking facilities normally available.

Grade B - ordinary design with good quality finishes; flexible layout; average-sized floor plates; adequate lobbies; central or free-standing air-conditioning; adequate lift services, good management; parking facilities not essential.

丙級 – 設計簡單及有基本裝修；間隔彈性較小；整層樓面面積狹小；大堂只有基本設施；一般並無中央空氣調節系統；升降機僅夠使用或不敷應用；管理服務屬最低至一般水平；並無停車設施。

Grade C - plain with basic finishes; less flexible layout; small floor plates; basic lobbies; generally without central air-conditioning; barely adequate or inadequate lift services; minimal to average management; no parking facilities.

寫字樓的所在地點並不影響等級。屬香港特別行政區政府所有並由政府產業處管理的寫字樓並不包括在本報告內。

It should be noted that location is not a feature of grade. Offices owned by the Government of the Hong Kong Special Administrative Region and managed by the Government Property Agency are excluded.

4.5 私人商業樓宇包括零售業樓宇及其他設計或改建作商業用途的樓宇，但不包括專作寫字樓用途的樓宇，亦不包括車位。房屋委員會和房屋協會所持有的商業樓宇並不包括在內。自房屋委員會於2005年底把旗下部分商業樓宇分拆出售予領匯房地產投資信託基金（領匯）後，這些分拆出售的物業現已由領匯持有，並歸入私人物業類別。2006年及之後的統計數字已包括這類別物業的數據在內。讀者把報告年度內的統計數字跟2005年及之前的統計數字作比較時，要特別留意有關轉變。

4.5 Private Commercial premises include retail premises and other premises designed or adapted for commercial use, with the exception of purpose-built offices. Carparking space is excluded. Commercial premises owned by the Housing Authority and Housing Society are excluded. Following the divestment of selected commercial Housing Authority premises to The Link Real Estate Investment Trust (The Link REIT) at the end of 2005, these divested properties now owned by The Link REIT are classified as private sector properties and are included in the statistics from 2006 onwards. Readers should take special note of this change when comparing review year figures with those of 2005 and before.

4.6 私人分層工廠大廈包括為一般製造業工序及與該等工序有直接關係的用途（包括寫字樓）而建設，並通常由發展商出售或出租的樓宇。此類物業並不包括下述的特殊廠房。房屋委員會興建的工廠樓宇也不包括在內。

4.6 Private Flatted Factories comprise premises designed for general manufacturing processes and uses, including offices, directly related to such processes, and normally intended for sale or letting by the developers. Specialised factories, as described below, are excluded. Similar premises built by the Housing Authority are not included.

4.7 私人工貿大廈是設計或獲證明作工貿用途的樓面面積。

4.7 Private Industrial / Office premises are floor space designed or certified for industrial/office use.

4.8 私人特殊廠房包括所有其他廠房，主要是為特殊製造業而建的廠房，每間廠房通常由一名廠東使用。

4.8 Private Specialised Factories comprise all other factory premises, primarily purpose-built for specialised manufacturing processes, usually for occupation by a single operator.

4.9 私人貨倉包括設計或改建作倉庫或冷藏庫的樓宇及其附屬寫字樓，並包括位於貨櫃碼頭區內的樓宇。

5. 樓面面積

5.1 住宅單位的樓面面積是以「實用面積」來計算。「實用面積」是指單位獨佔的樓面面積，包括露台及外廊，但不包括樓梯、升降機槽、渠管、大堂及公用廁所等公用地方。量度「實用面積」時，是從圍繞該單位的外牆向外的一面或該單位與毗連單位的共用牆的中間點起計。窗台、天井、花園、庭院、平台、車位等地方則不包括在內。

5.2 非住宅樓宇的面積是以「內部樓面面積」來計算，量度範圍是有關單位牆壁（或與毗連單位的共用牆）向內的一面所圍繞的全部面積。

6. 樓宇總存量

6.1 私人住宅和非住宅樓宇的總存量，都是以某一指定日期的差餉估價記錄為根據。

6.2 各類物業的總存量並不包括上文第4段所述的公營房屋數字。私人商業樓宇的總存量亦包括私人機構參建居屋計劃的商業樓宇面積。

7. 落成量

7.1 私人樓宇的落成量是指獲發佔用許可證的樓宇數量。

4.9 Private Storage premises comprise premises designed or adapted for use as godowns or cold stores and include ancillary offices. Premises located within container terminals are included.

5. Floor Areas

5.1 A domestic unit is measured on the basis of 'saleable area' which is defined as the floor area exclusively allocated to the unit including balconies and verandahs but excluding common areas such as stairs, lift shafts, pipe ducts, lobbies and communal toilets. It is measured from the outside of the exterior enclosing walls of the unit and the middle of the party walls between two units. Bay windows, yards, gardens, terraces, flat roofs, carports and the like are excluded from the area.

5.2 Non-domestic accommodation is measured on the basis of 'internal floor area' which is defined as the area of all enclosed space of the unit measured to the internal face of enclosing external and/or party walls.

6. Stock

6.1 Both private domestic and non-domestic stock figures are based on rating records at a given date.

6.2 Public sector figures as mentioned in paragraph 4 above for each property type are excluded. The Private Commercial stock figure also includes commercial premises built under the Private Sector Participation Scheme.

7. Completions

7.1 Completions of private sector premises comprise those premises deemed completed by virtue of the issue of an occupation permit.

7.2 各類物業的落成量並不包括上文第4段所述的公營房屋落成量。

8. 拆卸量

這是指在報告年度內因拆卸而從差餉估價記錄中刪除的私人樓宇數量。

9. 預測數量

9.1 這是指在報告年度隨後兩年的每年落成量預測數字。住宅樓宇是以單位數目計算，非住宅樓宇則以內部樓面總面積計算。

9.2 本署是根據屋宇署的統計數字、建築師及發展商提供的圖則及資料、專業估計及／或實地視察所得的資料，就全港各已知的物業發展項目及重建地盤計算預測落成量。

9.3 上文第4段所述的公營房屋發展項目並不包括在內。

10. 空置量

10.1 空置量是指在年底進行普查時，單位實際上未被佔用。正在裝修的物業一般都界定為空置。有些單位因未獲發滿意紙或轉讓同意書而未能入住或使用，以致空置。讀者應注意，**空置量與物業是否已由發展商售出無關**。即使是已售出的物業也可能仍然空置，有待業主或租客日後佔用。空置量數字涵蓋所有總存量，並非單指新發展項目。

7.2 Public sector completion figures, as mentioned in paragraph 4 above for each property type, are not included.

8. Demolition

The figures show rated private accommodation deleted during the year under review due to demolition.

9. Forecast

9.1 Forecast figures of completions are given for each of the two years succeeding the year under review. They are presented as the number of units (for domestic premises) and the total internal floor area (for non-domestic premises) expected to come on stream in the respective years.

9.2 To arrive at the figures, data are compiled in respect of all known development and redevelopment sites in the territory in accordance with information derived from Buildings Department returns, architects' and developers' plans and returns, professional estimates and/or site visits.

9.3 Public sector developments as mentioned in paragraph 4 above are not included.

10. Vacancies

10.1 Vacancy indicates that a unit was not physically occupied at the time of the survey conducted at the end of the year. Premises under decoration are classified as vacant. Some vacancies could be due to units not yet issued with the Certificate of Compliance or Consent to Assign, which therefore could not have been occupied. It should be noted that **vacancy bears no relationship to whether the property has been sold by the developer**. Premises which have already been sold may remain vacant, pending occupation by the owner or tenant. Vacancy figures cover the entire stock and are not confined to new developments.

10.2 所有樓宇的空置量，都是在年底進行樓宇普查後計算出來的，但在2005年前落成並已評估差餉的住宅樓宇則另有處理方法。空置物業數據是向大廈管理處、業主和佔用人蒐集，或本署派員視察而獲得的。

10.3 在2005年前落成並已評估差餉的住宅樓宇，其空置量是根據抽樣調查該等樓宇3%的單位所得結果來推算的。

11. 入住量／使用量

11.1 住宅樓宇的入住量，是指在報告年度內**入住**的單位數目淨增長額；非住宅樓宇的使用量，則是年內**使用**的樓面面積淨增長額。

11.2 有關數字的計算方法是把年內落成量與年初空置量相加，然後減去該年的拆卸量及年終空置量。

11.3 **與空置量一樣，入住量／使用量與發展商已售出的單位數目或樓面面積（一手市場交易）無關，故不應與新建物業的銷售混為一談。**

12. 平均租金和售價

12.1 本署會分析新訂租約的租金資料，以計算在租金生效月份的平均租金。就非住宅樓宇而言，分析資料包括續租時議定的租金，而生效日期即為租賃協議的生效日期。不過，租金一般是在較早的日期議定（新訂租約是在2至4周前，續訂租約是在1至3個月前）。由2006年中起，零售業樓宇的租金資料包括由領匯所持有的物業（詳情可參考上文第4.5段）。

10.2 Vacancies in respect of all premises, with the exception of rated domestic premises completed prior to 2005, are determined by a full survey of such premises at the end of the year. The vacancy data are obtained from management offices, owners, occupiers or by inspection.

10.3 For rated domestic premises completed prior to 2005, a projection of vacancies is made from the result of a 3% random sample survey of such units.

11. Take-up

11.1 Take-up figures in respect of domestic premises represent the net increase in the number of units **occupied** in the year under review and for non-domestic premises, the net increase in **occupied** floor space in the year.

11.2 The figures are arrived at by adding the completions in that year to the vacancy figures at the beginning of the year, then subtracting the year's demolition and the year end vacancy figures.

11.3 **Much like vacancy, take-up should not be confused with the sales of new developments. Take-up bears no relationship to the number of units or amount of space sold by developers (primary market transactions).**

12. Average Rents and Prices

12.1 Average rents are based on an analysis of rental information recorded by the Department for fresh lettings effective in the month being analysed. For non-domestic premises, rents negotiated on renewal are also included. The effective date is the commencement date of a tenancy agreement. However, rents are normally agreed earlier (2-4 weeks earlier for fresh lettings, and 1-3 months for lease renewals). Rental statistics of retail premises from mid-2006 onwards include properties owned by The Link REIT (for details, please refer to paragraph 4.5 above).

12.2 本署從多個不同的來源獲得租金資料，包括按照《業主與租客（綜合）條例》的規定所遞交的新租約通知書、按照《差餉條例》與《地租（評估及徵收）條例》的規定而發出的物業詳情申報表、業主和租客的來信，以及本署職員進行實地視察時所得的資料。

12.2 Information is obtained from a variety of sources including notifications of fresh lettings made under the provisions of the Landlord and Tenant (Consolidation) Ordinance, requisitions issued under the provisions of the Rating Ordinance and the Government Rent (Assessment and Collection) Ordinance, letters from landlords and tenants and site visits made by staff of the Department.

12.3 分析租金時，是根據淨額計算，即不包括差餉、管理費及其他費用。

12.3 Rents are analysed on a net basis i.e. exclusive of rates, management and other charges.

12.4 計算平均售價時，本署會分析經過審查以釐定印花稅的樓宇交易資料。惟下列類別樓宇交易並不會用作分析：不被接納用作釐定印花稅的樓宇買賣、涉及不同類別物業的買賣、未獲評估差餉的樓宇、並非交吉出售的住宅樓宇，以及住宅樓宇的首次買賣。買賣日期以簽署買賣合約的日期為準，一般是在達成臨時協議後2至3周。

12.4 Average prices are based on an analysis of transactions scrutinised by the Department for stamp duty purposes. The following types of transactions are excluded : those considered to be unacceptable for stamp duty purposes, those involving a mix of property types, premises which have not yet been assessed to rates, domestic premises sold subject to existing tenancies, and primary sales of domestic premises. Date of sale is the date on which an Agreement for Sale and Purchase is signed. It should be borne in mind that provisional agreement is generally reached 2-3 weeks earlier.

12.5 有關平均租金和售價的分析，只供一般參考用途。某段時期的水平，主要取決於期內出租或出售物業的特點，包括樓宇質素及位置。因此，在不同時期內出現的變化，可能是因為在兩個時段所分析的不同物業的質素有所差異，而**不應**一概而論視之為該時段中在價值方面的整體變化。尤其是加上括號的數字，表示交易數量有限，使用這些數字時應特別小心。相對而言，租金與售價指數能較準確地反映價值的轉變。

12.5 Average rents and prices are analysed for general reference only. Their levels at a certain period depend to a large extent on the special characteristics, including quality and location, of the premises which are leased or sold during the period. Thus changes between different periods may be due to variations in the characteristics of the different properties being analysed, and should **not** be taken as necessarily indicating a general change in value over the period. In particular, figures in brackets denote limited number of transactions, and should be used with caution. Rental and price indices are a better reflection of change in value.

12.6 報告年度內最後數個月的租金與售價數字，均屬臨時性質，有待本署取得更多資料後再作分析。

12.6 The rental and price figures for a few months at the end of the year are provisional, pending the availability of further data for analysis.

12.7 租金和售價的統計數字，包括村屋，以及政府資助房屋單位在業權轉讓限制期屆滿及向有關機構繳付補價後，在公開市場的租賃和買賣。這方面與樓宇總存量和落成量所涵蓋的物業有所不同。

12.7 Unlike the coverage of stock and completion figures, rental and price statistics include village houses, and also open market lettings and sales of Government-subsidised housing units upon expiry of the restriction period and payment of the premium to the relevant bodies.

13. 租金和售價指數

13. Rental and Price Indices

13.1 如上文解釋，不同時期的平均租金及售價會有差異，這不單可能因為價值有變，也可能由於樓宇的質素有所改變。不過，制訂租金及售價指數，正是用來衡量在樓宇質素不變的情況下，租金及售價的轉變。因此，即使在同一時期，指數的轉變也可能跟平均租金及售價的轉變不同。

13.1 As explained above average rents and prices may change from one period to another not only because of value changes but also because of variations in quality. The rental and price indices, on the other hand, are designed to measure rental and price changes with quality kept at a constant. Movement of indices may therefore differ from changes in the average rents and prices for the same period.

13.2 計算租金和售價指數所根據的資料，跟用以計算平均租金和售價的數據相同。以指數衡量價值轉變時，是根據租金或售價除以有關物業的應課差餉租值所得的結果，而非根據每平方米樓面面積的租金或售價計算。實際上，利用應課差餉租值，不但考慮到樓面面積，也顧及到不同物業在質素上的其他差別。

13.2 The rental and price indices are derived from the same data that are used to compile average rents and prices. The indices measure value changes by reference to the factor of rent or price divided by rateable value of the subject properties rather than by reference to the rent or price per square metre of floor area. In effect, by utilising rateable value, allowance is made not only for floor area but also other qualitative differences between properties.

13.3 如應課差餉租值在全面重估後有所變更，新應課差餉租值會調算至舊應課差餉租值的水平，以便指數數列得以連貫。

13.3 Following a General Revaluation of rateable values, the new rateable values are matched with the old ones for the purpose of maintaining the index series.

13.4 成分指數（即某類別或級別物業的指數）是從分析所有在某指定期間內的交易結果計算出來的。各類樓宇的綜合指數，是將成分指數按**加權**平均法計算而得出。制訂各類非住宅樓宇綜合指數時所使用的權數，是根據該月份及之前11個月內有關類型樓宇的總樓面面積計算的。至於住宅樓宇，其租金和售價指數的權數，則是根據該月份及之前11個月內進行的交易數目計算出來。

13.4 The component index (the index for a property class or grade) has been derived from analysis of all transactions effective in a given period. The composite index for a certain type of premises is compiled by calculating a **weighted** average of the component indices. The weights for compiling the composite index for each type of non-domestic premises are based on the total floor area of components in respect of the current and previous 11 months. For domestic premises the weights for both rental and price indices are based on the number of transactions effected in the current and previous 11 months.

13.5 本報告提供每月、每季和每年指數。每季及每年指數都是有關時期內每月指數的平均數。

13.5 Monthly, quarterly and annual indices are shown. Quarterly and annual indices are the simple average of the monthly indices in respect of the relevant period.

13.6 指數（尤其是租金指數）未必能充分顯示出市場趨勢。雖然所有租金都是按淨額分析（參考上文第12.3段），但本署無法得知的其他「等同租值」租約條件，是不會計算在內的。例如在租賃市場供過於求時，業主通常都會給予租客一些優惠，包括整修樓宇或延長免租期等。如果為反映標準租約條件而調算租金，在指數下降時，經調算的租金很可能低於所報的租金。在指數上升時，情況則相反。

13.6 The indices, especially the rental indices, will tend to understate market trends. Although all rents are analysed on a net basis (see paragraph 12.3 above), allowances will not be made for the "value equivalent" of other contractual terms that are unknown to the Department. In a "tenants market" for example, landlords are normally prepared to make concessions to tenants such as refurbishment or the granting of extended rent-free periods. If rents were adjusted to reflect standard terms of agreement, the rents as adjusted would tend to be lower than the quoted rents when the index is moving downwards and vice versa.

14. 較受歡迎屋苑的售價指數

14.1 這指數是根據獲選作分析的樓宇單位的買賣合約所載的售價來分析計算。在2006年獲選作分析的樓宇與以往所選的略有不同，包括：

港島 – 碧瑤灣、比華利山、賽西湖大廈、嘉雲臺、置富花園、會景閣、帝景園、豫苑、杏花邨、陽明山莊、光明臺、港運城、藍灣半島、康怡花園、浪琴園、貝沙灣、雍景臺、海怡半島、太古城、寶翠園、禮頓山、紅山半島、地利根德閣、樂陶苑。

九龍 – 窩打老道8號、泓景臺、星河明居、維港灣、麗港城、海逸豪園、美孚新邨、港灣豪庭、又一居、柏景灣、半島豪庭、滙景花園、傲雲峰、擎天半島、德福花園、君臨天下、漾日居、黃埔花園。

新界 – 海雲軒、愛琴海岸、碧堤半島、聚康山莊、映灣園、帝堡城、沙田第一城、牽晴間、愉景灣、愉景新城、粉嶺中心、花都廣場、浪琴軒、香港黃金海岸、康樂園、嘉湖山莊、匡湖居、新都城、維景灣畔、將軍澳中心、珀麗灣、疊茵庭、海濱花園、駿景園、加州豪園、浪翠園、太湖花園、新港城、帝琴灣、采葉庭、盈翠半島、屯門市廣場、雅典居、灝景灣、新時代廣場。

14. Price Indices for Selected Popular Residential Developments

14.1 The indices are based on an analysis of prices paid for units in selected developments as recorded in Sale and Purchase Agreements. Developments selected for analysis in 2006 are slightly different from those of previous years, and include :

Hong Kong - Baguio Villa, Beverly Hill, Braemar Hill Mansions, Cavendish Heights, Chi Fu Fa Yuen, Convention Plaza Apartments, Dynasty Court, Euston Court, Heng Fa Chuen, Hong Kong Parkview, Illumination Terrace, Island Place, Island Resort, Kornhill, Pacific View, Residence Bel-Air, Island South, Robinson Place, South Horizons, Taikoo Shing, The Belcher's, The Leighton Hill, The Redhill Peninsula, Tregunter, Villa Lotto;

Kowloon - 8 Waterloo Road, Banyan Garden, Galaxia, Island Harbourview, Laguna City, Laguna Verde, Mei Foo Sun Chuen, Metro Harbour View, Parc Oasis, Park Avenue, Royal Peninsula, Sceneway Garden, Sky Tower, Sorrento, Telford Gardens, The Harbourside, The Waterfront, Whampoa Garden;

New Territories - Anglers' Bay, Aegean Coast, Bellagio, Beneville, Caribbean Coast, Castello, City One, Sha Tin, Dawning Views, Discovery Bay, Discovery Park, Fanling Centre, Flora Plaza, Grand Pacific Views, Hong Kong Gold Coast, Hong Lok Yuen, Kingswood Villas, Marina Cove, Metro City, Ocean Shores, Park Central, Park Island, Parkland Villas, Riviera Gardens, Royal Ascot, Royal Palms, Sea Crest Villa, Serenity Park, Sunshine City, Symphony Bay, The Parcville, Tierra Verde, Tuen Mun Town Plaza, Villa Athena, Villa Esplanada, YOHO Town.

14.2 樓宇樣本中每個物業組別的成分指數，是根據物業的售價除以有關物業的應課差餉租值所得的結果計算出來。每個物業組別的綜合指數是成分指數的加權平均數，而2006年的權數是根據2005年內的交易宗數而釐定。

15. 落成後使用方式

此項分析只包括在報告年度內已評定差餉估價，並且在估價時已申報整間有人使用的新落成住宅單位。

16. 物業市場回報率

回報率是把「租金／應課差餉租值」的平均比率與「售價／應課差餉租值」的平均比率作比較後計算出來的。租金分析與售價分析所涵蓋的物業可能並不相同。因此，這方面的數字只能顯示普遍的物業回報率及市場趨勢。

17. 樓宇買賣

住宅樓宇買賣的統計數字來自土地註冊處，是根據在有關時期內送交土地註冊處作**登記**的住宅樓宇買賣合約而編製。至於非住宅樓宇的買賣統計數字，本署是根據土地註冊處的交易記錄及稅務局用以釐定印花稅的交易資料加以分析。與土地註冊處的住宅樓宇買賣統計數字不同，每段有關時期的非住宅樓宇買賣統計數字，是以**買賣合約的簽署日期**，而並非送交土地註冊處登記的日期為依據。

14.2 The component index for each property group in the sample developments is calculated by reference to the factor of price divided by rateable value of the subject properties. The composite index for a property group is compiled by calculating a weighted average of the component indices. For the year 2006, the weights are based on the number of transactions effected in 2005.

15. Mode of Occupation after Completion

This covers only newly completed domestic units valued for rating purposes in the year under review and reported wholly occupied at the time of valuation.

16. Property Market Yields

The yields have been derived by comparing the average rent/rateable value and price/rateable value factors. The properties included in the rental analysis may be different from those in the price analysis. The figures should therefore only be regarded as providing a broad indication of market yields and trends.

17. Sales Transactions

Statistics on domestic sales are sourced from the Land Registry, derived from sale and purchase agreements of domestic units **received for registration** in the Land Registry for the relevant periods. Statistics on non-domestic sales are based on analysis made of sales transaction records obtained by this Department from the Land Registry and Inland Revenue Department for stamp duty purposes. As distinguished from the Land Registry statistics on domestic sales, non-domestic figures for each relevant period refer to the **date on which an Agreement for Sale and Purchase is signed**, and not the date on which the Agreement is submitted for registration.

Appendix 3

Yield of Exchange Fund Bills (182-day) (1993-2007)

Year	Month	Rf(182-day)	Monthly Rf(182-day)
1993	1	3.29	0.27%
	2	3.03	0.25%
	3	3.05	0.25%
	4	2.86	0.24%
	5	3.34	0.28%
	6	3.51	0.29%
	7	3.46	0.29%
	8	3.03	0.25%
	9	3.04	0.25%
	10	2.87	0.24%
	11	3.15	0.26%
	12	3.24	0.27%
1994	1	3.07	0.26%
	2	3.65	0.30%
	3	3.99	0.33%
	4	4.27	0.36%
	5	4.56	0.38%
	6	4.69	0.39%
	7	4.62	0.39%
	8	4.66	0.39%
	9	4.78	0.40%
	10	5.32	0.44%
	11	5.75	0.48%
	12	6.24	0.52%
1995	1	6.82	0.57%
	2	6.26	0.52%
	3	5.71	0.48%
	4	6.06	0.51%
	5	5.76	0.48%

	6	5.54	0.46%
	7	5.57	0.46%
	8	5.82	0.49%
	9	5.75	0.48%
	10	5.58	0.47%
	11	5.57	0.46%
	12	5.53	0.46%
1996	1	5.25	0.44%
	2	5.09	0.42%
	3	5.16	0.43%
	4	5.23	0.44%
	5	5.23	0.44%
	6	5.47	0.46%
	7	5.46	0.46%
	8	5.32	0.44%
	9	5.31	0.44%
	10	4.98	0.42%
	11	4.73	0.39%
	12	4.65	0.39%
1997	1	4.79	0.40%
	2	5.01	0.42%
	3	5.38	0.45%
	4	5.62	0.47%
	5	5.62	0.47%
	6	5.72	0.48%
	7	6.48	0.54%
	8	7.03	0.59%
	9	6.63	0.55%
	10	9.95	0.83%
	11	8.79	0.73%
	12	8.53	0.71%
1998	1	9.81	0.82%
	2	6.70	0.56%
	3	6.74	0.56%
	4	6.58	0.55%

	5	7.52	0.63%
	6	9.90	0.83%
	7	8.54	0.71%
	8	11.88	0.99%
	9	8.08	0.67%
	10	6.49	0.54%
	11	5.91	0.49%
	12	5.37	0.45%
1999	1	6.44	0.54%
	2	6.07	0.51%
	3	5.64	0.47%
	4	5.00	0.42%
	5	5.35	0.45%
	6	5.57	0.46%
	7	5.64	0.47%
	8	5.88	0.49%
	9	5.72	0.48%
	10	5.62	0.47%
	11	5.34	0.45%
	12	5.35	0.45%
2000	1	5.70	0.48%
	2	5.87	0.49%
	3	5.89	0.49%
	4	6.35	0.53%
	5	6.79	0.57%
	6	6.35	0.53%
	7	6.11	0.51%
	8	6.06	0.51%
	9	6.07	0.51%
	10	5.89	0.49%
	11	5.78	0.48%
	12	5.53	0.46%
2001	1	4.82	0.40%
	2	4.67	0.39%
	3	4.62	0.39%

	4	4.08	0.34%
	5	3.60	0.30%
	6	3.45	0.29%
	7	3.43	0.29%
	8	3.16	0.26%
	9	2.19	0.18%
	10	1.90	0.16%
	11	1.79	0.15%
	12	1.78	0.15%
2002	1	1.78	0.15%
	2	1.83	0.15%
	3	2.22	0.19%
	4	1.89	0.16%
	5	1.79	0.15%
	6	1.75	0.15%
	7	1.57	0.13%
	8	1.51	0.13%
	9	1.63	0.14%
	10	1.64	0.14%
	11	1.39	0.12%
	12	1.37	0.11%
2003	1	1.26	0.11%
	2	1.22	0.10%
	3	1.07	0.09%
	4	1.23	0.10%
	5	1.04	0.09%
	6	0.84	0.07%
	7	0.94	0.08%
	8	0.95	0.08%
	9	0.64	0.05%
	10	0.38	0.03%
	11	0.26	0.02%
	12	-0.02	0.00%
2004	1	0.10	0.01%
	2	0.08	0.01%

	3	0.14	0.01%
	4	0.57	0.05%
	5	0.54	0.05%
	6	0.61	0.05%
	7	0.96	0.08%
	8	0.81	0.07%
	9	1.03	0.09%
	10	0.24	0.02%
	11	0.39	0.03%
	12	0.25	0.02%
2005	1	0.71	0.06%
	2	1.64	0.14%
	3	2.53	0.21%
	4	1.80	0.15%
	5	2.88	0.24%
	6	2.91	0.24%
	7	3.14	0.26%
	8	3.48	0.29%
	9	3.65	0.30%
	10	3.85	0.32%
	11	3.78	0.32%
	12	3.78	0.32%
2006	1	3.52	0.29%
	2	3.87	0.32%
	3	3.98	0.33%
	4	3.87	0.32%
	5	4.02	0.34%
	6	4.20	0.35%
	7	3.84	0.32%
	8	3.64	0.30%
	9	3.67	0.31%
	10	3.60	0.30%
	11	3.58	0.30%
	12	3.40	0.28%

2007	1	3.86	0.32%
	2	3.79	0.32%
	3	3.63	0.30%
	4	3.83	0.32%
	5	4.14	0.35%
	6	3.97	0.33%
	7	3.77	0.31%
	8	4.04	0.34%
	9	3.37	0.28%
	10	2.38	0.20%
	11	0.51	0.04%
	12	2.11	0.18%

(Source: Monthly Statistical Bulletin, Hong Kong Monetary Authority (2008))

Appendix 4

Private Domestic – Price Indices of Different Classes (Territory-wide) (1999=100)

Year	Month	Class A	Class B	Class C	Class D	Class E
1993	1	90.4	81.3	80.7	74.2	58.1
	2	90.5	82.6	81.3	74.9	62.2
	3	90.2	83.9	81.9	75.4	64.6
	4	92.5	85.4	83.7	76.8	66.2
	5	95.9	88.6	85.9	80.5	72.3
	6	98.3	94	91.4	86.9	76.3
	7	100.1	98	97.6	90.6	79.2
	8	101	97.9	96.1	91.1	76.8
	9	100.7	96.2	95.5	88.7	79
	10	97.8	94.4	95.6	90	83.2
	11	99.5	97.3	97.5	92.9	85.3
	12	102.2	100.2	100.3	99	92.4
1994	1	106.3	108.6	110.2	106.6	104
	2	109.9	112.9	113.3	111.1	108.3
	3	114.5	122.9	123.2	119.7	120.2
	4	116.9	117.7	123.8	124.3	120.5
	5	114.8	115.8	123	115.4	116.3
	6	114.1	116.7	122.8	119	112.8
	7	113.5	113	118.6	116.7	112.1
	8	116.7	117.4	122.7	123.5	115.6
	9	116.1	115.6	121.1	117	118
	10	116.5	116.7	118.4	119.7	115.1
	11	115.7	114.1	117.6	117.7	116.4
	12	110.2	108.9	114.5	112.2	118.4
1995	1	109.9	109.9	110.8	111	111.3
	2	113.9	112.4	109.8	102.3	99.5
	3	114.2	112.9	112.7	108.9	113.1
	4	114.7	111.2	112	109.1	113.6

	5	110.8	109.4	111.5	109.8	103.5
	6	110.4	106	108.8	108.1	108.7
	7	108.5	105	104.9	103.2	104.3
	8	108	102.4	105.4	102.1	101.3
	9	104.5	99.6	99.9	98.9	96.1
	10	103.5	99.1	98.9	96.6	96.2
	11	105.4	102	100.6	99.7	99.3
	12	106.3	102.7	102.9	99.2	94
1996	1	106.9	104.7	102	100.2	102.5
	2	109.1	108.6	107.2	106.4	104.5
	3	112.2	114.5	109.2	107.6	109.9
	4	112.1	112.4	110.9	109.6	113.4
	5	113.3	113.5	114.2	111.7	116.8
	6	114.7	114.8	117.1	114.8	116.3
	7	115.4	114	114.2	115	115.8
	8	116.8	118.5	116.4	113.9	115.6
	9	119	117.7	117	118.7	116.5
	10	122.4	123.3	124	125.7	124.1
	11	127.1	128.2	129.1	130	135.7
	12	132.5	135.2	136.5	139.2	140.2
1997	1	137.9	143.6	148.8	156.1	160.9
	2	151.1	154.6	160.6	163.4	164.2
	3	160.6	162.4	167.1	163.1	166.4
	4	154.5	157.8	162.1	160.6	159.5
	5	169.5	173.7	175.3	175	184.6
	6	171	171	177.7	176.1	179.6
	7	165.1	166.7	174.4	171.9	180
	8	168.8	170.5	180.2	174.2	185
	9	170.2	169.1	174.3	174.4	173.5
	10	171.1	172.1	178.7	178.2	198.2
	11	161.2	157	166.9	173.1	166.4
	12	155.4	153.4	160	156.1	156.3
1998	1	145.2	141	148.9	147.4	142.2
	2	138.5	134.6	136.2	138.5	135.7
	3	140.4	137.9	137.4	137.6	128.1

	4	135.5	133.4	136.3	131.3	126.6
	5	129.4	126.2	128.2	125.2	126.8
	6	114	111.7	110	111	118
	7	110.2	105.9	110.6	105.9	104.3
	8	106.3	104.3	102.1	99.1	98.5
	9	100.4	96.8	99.6	102.1	92.8
	10	96.6	95.1	95.2	94.1	96.3
	11	100.7	110.4	99.1	101.2	94.4
	12	105	105	103.5	100.2	104.5
1999	1	103.9	103.9	105	102	98.2
	2	103	101.7	102.8	98	97.5
	3	102.4	102.2	99.1	99.6	94.8
	4	102.7	101.8	101.4	100.5	101.7
	5	103.1	103.1	102.6	100.7	101.8
	6	103.3	101.5	101.8	103.4	102.2
	7	101.8	101.4	100	105.3	100.2
	8	99.3	101.3	100.5	100.8	103.2
	9	96.8	97	98	99.7	97.2
	10	95.5	95.7	96.5	97.6	99.1
	11	93.2	94.5	95.1	95.1	105.2
	12	94.9	95.8	97.1	97.3	99
2000	1	96.6	97.5	98.4	98.8	107.4
	2	96.2	98	98.2	99.7	102
	3	93.2	95.8	97.6	99.7	102.3
	4	92.4	93.8	96.8	99.2	101.2
	5	89	89.9	92.1	99.1	96.9
	6	84.5	85.6	89.5	91.5	95.3
	7	86	86.2	88	90.7	92.4
	8	86	87.1	88.1	91.2	95.7
	9	87.4	88	88.6	92.3	98
	10	86.5	86.4	88.1	91.2	98.4
	11	81.3	84.1	85.5	89.3	98.2
	12	80.2	81.6	83.7	88.5	96.5
2001	1	78.9	80.5	83.4	88.4	94.6
	2	78.7	80	83	85.3	91.3

	3	80.5	82.3	83.9	87.2	88.7
	4	81.9	81.4	84.6	87.5	90
	5	79	80.5	83.8	83.4	88.5
	6	78.7	81.3	85.3	82.5	88.8
	7	78.7	80.5	81.8	83	88.7
	8	76.7	79.1	78.8	83.8	89.9
	9	75.9	77.5	78.1	81.1	87.5
	10	72.7	74.4	75.7	78.8	80.9
	11	71.9	74	75.2	78.5	82.1
	12	72.3	74.1	75.5	78.4	82.5
2002	1	72.6	74.5	75.7	78.2	84
	2	73.4	73.7	74.3	78.2	86.2
	3	71.9	73.6	74.3	78	85.2
	4	70.4	72.7	74.3	77.9	84.9
	5	69.4	73.7	73.9	77.7	84.4
	6	69.4	72.6	74.3	77.3	83.2
	7	69	71.4	72.3	77.2	80.8
	8	66.9	68.1	70.6	76.4	79.2
	9	64.1	67.5	68.4	75.3	76.9
	10	64	64.7	68.7	75.1	77.2
	11	62.9	64.9	68.8	75.1	79.4
	12	62.7	64.9	67	73.1	80.5
2003	1	61.5	63.4	67.2	72.6	79.9
	2	61	63.8	66.5	70.7	75.7
	3	60	60.6	64.3	68.8	73.9
	4	59.4	59.8	64.1	67.7	72.6
	5	58.2	59.3	63.3	67.6	71.2
	6	57.3	59.2	62.6	66.6	71.7
	7	56.6	58.3	61.1	64.9	73.4
	8	56.8	58.5	60.8	66.2	73.7
	9	59.1	60.2	65.5	70.5	75.1
	10	61.3	62.5	68.6	73.8	80.4
	11	62.1	63.6	69.5	74.3	81.7
	12	63.2	64.4	70	79.1	85.6

2004	1	66.4	68.8	75.4	81.1	92.2
	2	69.2	72.4	81.5	86.9	96.2
	3	72.9	77.1	89	96	102.9
	4	73.4	79.2	89.3	98.1	101.7
	5	72.8	76.4	87.4	96	103.1
	6	69.7	73.9	83.2	92.1	106.3
	7	70	74	83.9	93.4	103.5
	8	73.1	76.4	87.8	93.3	104.1
	9	74.7	80.5	91.2	100.3	113.8
	10	77.6	83.2	95.8	106	117.1
	11	75.9	81.6	95.1	106.8	117.3
	12	76.4	82.6	94.1	107.9	120.8
2005	1	78.6	84.5	98.9	112.7	124
	2	81.6	89.4	102.1	110.9	127
	3	87.6	94	108.7	118.7	125.9
	4	88.5	94.5	110.2	120.7	134.8
	5	87.2	95	112.3	119.4	132.1
	6	85.9	91.8	108.4	121.4	131.2
	7	84.9	92.2	109.3	122.4	129
	8	86.3	93.9	106.5	122.1	131.3
	9	86.7	93.3	109.9	121.6	138.2
	10	85.8	90.5	107.1	121.6	135.9
	11	82.5	87.5	102.1	118.8	130.1
	12	83.7	89.5	103.6	119.4	135.6
2006	1	84.1	90.7	105	117.5	136.7
	2	84.3	90.9	106	117.5	138.5
	3	86.6	91.8	108.3	119	137.3
	4	86.6	92.9	109.8	121.9	138.8
	5	87.6	93.1	110.1	124.6	135.1
	6	86	91.4	107.8	119.7	140.3
	7	85.7	91.2	106.4	117.8	133.2
	8	87.3	91.5	106.8	123.1	140.8
	9	87.6	91.8	108.1	121.5	141.8
	10	87.3	91.5	108.1	123	135.3
	11	87.4	91.1	109.4	122.8	134.2

	12	88.4	91.6	109.8	123.2	139.2
2007	1	89.4	93.4	109.9	125.5	145.3
	2	91	94.6	111.5	127.6	144.6
	3	93.3	95.4	112	128.1	149.6
	4	94.1	95.8	114.1	131.2	152.5
	5	95.5	97.9	116.6	131.5	153.7
	6	96.6	98.8	117.1	135.7	156.1
	7	97.6	100.2	118.8	136.1	157.2
	8	98.9	101	120.1	140.3	164.9
	9	100	102.4	120.9	142.4	169.2
	10*	103.4	104.8	124.9	145.9	176.4
	11*	108.2	108.4	131.3	151.9	178.9
	12*	111.3	111.8	137.4	158.7	194.9
Price volatility (SD of pi) (Correct to 2 d.p.)		**25.36**	**24.56**	**25.21**	**25.67**	**29.46**

*Provisional Figures

(Source: Historical Data, Rating and Valuation Department (2008))

Appendix 5

Private Domestic – Rate of Return of Different Classes

Year	Month	Class A	Class B	Class C	Class D	Class E
1993	1	-	-	-	-	-
	2	0.1106%	1.5864%	0.7407%	0.9390%	6.8189%
	3	-0.3320%	1.5616%	0.7353%	0.6653%	3.7859%
	4	2.5179%	1.7720%	2.1740%	1.8397%	2.4466%
	5	3.6097%	3.6786%	2.5945%	4.7053%	8.8144%
	6	2.4718%	5.9163%	6.2062%	7.6501%	5.3849%
	7	1.8146%	4.1673%	6.5632%	4.1696%	3.7303%
	8	0.8951%	-0.1021%	-1.5488%	0.5504%	-3.0772%
	9	-0.2975%	-1.7517%	-0.6263%	-2.6698%	2.8243%
	10	-2.9221%	-1.8888%	0.1047%	1.4550%	5.1799%
	11	1.7233%	3.0258%	1.9680%	3.1714%	2.4927%
	12	2.6774%	2.9369%	2.8313%	6.3596%	7.9953%
1994	1	3.9334%	8.0503%	9.4131%	7.3964%	11.8264%
	2	3.3306%	3.8831%	2.7742%	4.1347%	4.0514%
	3	4.1004%	8.4869%	8.3770%	7.4558%	10.4252%
	4	2.0744%	-4.3232%	0.4858%	3.7709%	0.2493%
	5	-1.8127%	-1.6274%	-0.6483%	-7.4294%	-3.5477%
	6	-0.6116%	0.7742%	-0.1627%	3.0719%	-3.0557%
	7	-0.5272%	-3.2219%	-3.4801%	-1.9517%	-0.6225%
	8	2.7804%	3.8199%	3.3986%	5.6635%	3.0745%
	9	-0.5155%	-1.5451%	-1.3126%	-5.4067%	2.0549%
	10	0.3439%	0.9471%	-2.2548%	2.2815%	-2.4883%
	11	-0.6891%	-2.2531%	-0.6780%	-1.6850%	1.1231%
	12	-4.8704%	-4.6645%	-2.6714%	-4.7856%	1.7036%
1995	1	-0.2726%	0.9141%	-3.2848%	-1.0753%	-6.1839%
	2	3.5750%	2.2493%	-0.9066%	-8.1621%	-11.2072%
	3	0.2630%	0.4439%	2.6069%	6.2520%	12.8115%
	4	0.4369%	-1.5172%	-0.6231%	0.1835%	0.4411%
	5	-3.4593%	-1.6319%	-0.4474%	0.6396%	-9.3112%

	6	-0.3617%	-3.1572%	-2.4513%	-1.5604%	4.9020%
	7	-1.7360%	-0.9479%	-3.6504%	-4.6388%	-4.1320%
	8	-0.4619%	-2.5074%	0.4755%	-1.0716%	-2.9185%
	9	-3.2944%	-2.7725%	-5.3593%	-3.1843%	-5.2697%
	10	-0.9615%	-0.5033%	-1.0060%	-2.3530%	0.1040%
	11	1.8191%	2.8843%	1.7043%	3.1587%	3.1716%
	12	0.8503%	0.6839%	2.2605%	-0.5028%	-5.4851%
1996	1	0.5629%	1.9287%	-0.8785%	1.0030%	8.6568%
	2	2.0371%	3.6572%	4.9723%	6.0037%	1.9324%
	3	2.8018%	5.2903%	1.8485%	1.1215%	5.0384%
	4	-0.0892%	-1.8511%	1.5448%	1.8417%	3.1351%
	5	1.0648%	0.9739%	2.9322%	1.8979%	2.9542%
	6	1.2281%	1.1389%	2.5077%	2.7375%	-0.4290%
	7	0.6084%	-0.6993%	-2.5077%	0.1741%	-0.4308%
	8	1.2059%	3.8715%	1.9081%	-0.9611%	-0.1729%
	9	1.8660%	-0.6774%	0.5141%	4.1278%	0.7755%
	10	2.8171%	4.6481%	5.8108%	5.7299%	6.3196%
	11	3.7680%	3.8971%	4.0306%	3.3636%	8.9359%
	12	4.1608%	5.3164%	5.5737%	6.8377%	3.2623%
1997	1	3.9946%	6.0276%	8.6279%	11.4585%	13.7713%
	2	9.1413%	7.3809%	7.6314%	4.5704%	2.0302%
	3	6.0975%	4.9221%	3.9676%	-0.1838%	1.3309%
	4	-3.8723%	-2.8734%	-3.0379%	-1.5447%	-4.2351%
	5	9.2659%	9.6001%	7.8285%	8.5869%	14.6147%
	6	0.8811%	-1.5666%	1.3598%	0.6266%	-2.7459%
	7	-3.5112%	-2.5468%	-1.8745%	-2.4139%	0.2225%
	8	2.2163%	2.2540%	3.2716%	1.3291%	2.7399%
	9	0.8260%	-0.8245%	-3.3289%	0.1147%	-6.4178%
	10	0.5274%	1.7585%	2.4930%	2.1555%	13.3099%
	11	-5.9602%	-9.1830%	-6.8314%	-2.9037%	-17.4882%
	12	-3.6643%	-2.3197%	-4.2221%	-10.3373%	-6.2617%
1998	1	-6.7890%	-8.4289%	-7.1899%	-5.7347%	-9.4543%
	2	-4.7242%	-4.6452%	-8.9151%	-6.2280%	-4.6788%
	3	1.3625%	2.4221%	0.8772%	-0.6519%	-5.7635%
	4	-3.5524%	-3.3177%	-0.8038%	-4.6866%	-1.1779%

	5	-4.6063%	-5.5484%	-6.1267%	-4.7572%	0.1579%
	6	-12.6710%	-12.2051%	-15.3111%	-12.0382%	-7.1926%
	7	-3.3902%	-5.3321%	0.5440%	-4.7035%	-12.3413%
	8	-3.6032%	-1.5224%	-7.9967%	-6.6366%	-5.7215%
	9	-5.7103%	-7.4624%	-2.4791%	2.9823%	-5.9610%
	10	-3.8583%	-1.7718%	-4.5182%	-8.1595%	3.7022%
	11	4.1567%	14.9181%	4.0149%	7.2741%	-1.9927%
	12	4.1815%	-5.0150%	4.3442%	-0.9931%	10.1646%
1999	1	-1.0531%	-1.0531%	1.4389%	1.7805%	-6.2181%
	2	-0.8700%	-2.1402%	-2.1175%	-4.0005%	-0.7154%
	3	-0.5842%	0.4904%	-3.6656%	1.6195%	-2.8083%
	4	0.2925%	-0.3922%	2.2944%	0.8996%	7.0258%
	5	0.3887%	1.2689%	1.1765%	0.1988%	0.0983%
	6	0.1938%	-1.5641%	-0.7828%	2.6459%	0.3922%
	7	-1.4627%	-0.0986%	-1.7840%	1.8208%	-1.9763%
	8	-2.4865%	-0.0987%	0.4988%	-4.3675%	2.9501%
	9	-2.5499%	-4.3375%	-2.5190%	-1.0973%	-5.9898%
	10	-1.3521%	-1.3493%	-1.5424%	-2.1288%	1.9359%
	11	-2.4379%	-1.2618%	-1.4614%	-2.5949%	5.9734%
	12	1.8076%	1.3663%	2.0812%	2.2870%	-6.0743%
2000	1	1.7755%	1.7590%	1.3299%	1.5299%	8.1440%
	2	-0.4149%	0.5115%	-0.2035%	0.9068%	-5.1587%
	3	-3.1682%	-2.2705%	-0.6129%	0.0000%	0.2937%
	4	-0.8621%	-2.1098%	-0.8230%	-0.5028%	-1.0811%
	5	-3.7491%	-4.2467%	-4.9772%	-0.1009%	-4.3419%
	6	-5.1885%	-4.9013%	-2.8636%	-7.9790%	-1.6650%
	7	1.7596%	0.6985%	-1.6902%	-0.8782%	-3.0903%
	8	0.0000%	1.0387%	0.1136%	0.5498%	3.5091%
	9	1.6148%	1.0280%	0.5659%	1.1989%	2.3749%
	10	-1.0351%	-1.8349%	-0.5659%	-1.1989%	0.4073%
	11	-6.1998%	-2.6981%	-2.9956%	-2.1053%	-0.2035%
	12	-1.3623%	-3.0177%	-2.1277%	-0.8999%	-1.7463%
2001	1	-1.6342%	-1.3572%	-0.3591%	-0.1131%	-1.9886%
	2	-0.2538%	-0.6231%	-0.4808%	-3.5698%	-3.5507%
	3	2.2614%	2.8344%	1.0785%	2.2030%	-2.8891%

	4	1.7242%	-1.0996%	0.8309%	0.3434%	1.4550%
	5	-3.6051%	-1.1118%	-0.9501%	-4.7990%	-1.6807%
	6	-0.3805%	0.9889%	1.7741%	-1.0850%	0.3384%
	7	0.0000%	-0.9889%	-4.1897%	0.6042%	-0.1127%
	8	-2.5741%	-1.7544%	-3.7364%	0.9592%	1.3438%
	9	-1.0485%	-2.0435%	-0.8923%	-3.2750%	-2.7059%
	10	-4.3075%	-4.0822%	-3.1212%	-2.8770%	-7.8425%
	11	-1.1065%	-0.5391%	-0.6627%	-0.3814%	1.4724%
	12	0.5548%	0.1350%	0.3981%	-0.1275%	0.4860%
2002	1	0.4141%	0.5384%	0.2646%	-0.2554%	1.8019%
	2	1.0959%	-1.0796%	-1.8667%	0.0000%	2.5853%
	3	-2.0648%	-0.1358%	0.0000%	-0.2561%	-1.1669%
	4	-2.1083%	-1.2304%	0.0000%	-0.1283%	-0.3527%
	5	-1.4306%	1.3661%	-0.5398%	-0.2571%	-0.5907%
	6	0.0000%	-1.5038%	0.5398%	-0.5161%	-1.4320%
	7	-0.5780%	-1.6667%	-2.7287%	-0.1294%	-2.9270%
	8	-3.0908%	-4.7321%	-2.3794%	-1.0417%	-2.0001%
	9	-4.2755%	-0.8850%	-3.1657%	-1.4503%	-2.9470%
	10	-0.1561%	-4.2366%	0.4376%	-0.2660%	0.3894%
	11	-1.7337%	0.3086%	0.1455%	0.0000%	2.8099%
	12	-0.3185%	0.0000%	-2.6511%	-2.6992%	1.3759%
2003	1	-1.9324%	-2.3384%	0.2981%	-0.6863%	-0.7481%
	2	-0.8163%	0.6289%	-1.0471%	-2.6519%	-5.3998%
	3	-1.6529%	-5.1458%	-3.3642%	-2.7242%	-2.4065%
	4	-1.0050%	-1.3289%	-0.3115%	-1.6118%	-1.7748%
	5	-2.0409%	-0.8396%	-1.2559%	-0.1478%	-1.9472%
	6	-1.5585%	-0.1688%	-1.1120%	-1.4903%	0.6998%
	7	-1.2292%	-1.5319%	-2.4253%	-2.5857%	2.3433%
	8	0.3527%	0.3425%	-0.4922%	1.9833%	0.4079%
	9	3.9695%	2.8646%	7.4460%	6.2932%	1.8818%
	10	3.6549%	3.7494%	4.6242%	4.5746%	6.8194%
	11	1.2966%	1.7447%	1.3034%	0.6752%	1.6040%
	12	1.7558%	1.2500%	0.7168%	6.2602%	4.6631%
2004	1	4.9393%	6.6090%	7.4312%	2.4970%	7.4275%
	2	4.1304%	5.1003%	7.7796%	6.9075%	4.2469%

	3	5.2088%	6.2897%	8.8033%	9.9590%	6.7328%
	4	0.6835%	2.6873%	0.3365%	2.1639%	-1.1730%
	5	-0.8208%	-3.5994%	-2.1506%	-2.1639%	1.3672%
	6	-4.3516%	-3.3270%	-4.9248%	-4.1473%	3.0566%
	7	0.4295%	0.1352%	0.8378%	1.4016%	-2.6694%
	8	4.3333%	3.1918%	4.5436%	-0.1071%	0.5780%
	9	2.1652%	5.2274%	3.7993%	7.2346%	8.9091%
	10	3.8087%	3.2990%	4.9208%	5.5273%	2.8586%
	11	-2.2151%	-1.9418%	-0.7334%	0.7519%	0.1706%
	12	0.6566%	1.2180%	-1.0571%	1.0247%	2.9402%
2005	1	2.8389%	2.2742%	4.9751%	4.3525%	2.6145%
	2	3.7458%	5.6369%	3.1843%	-1.6101%	2.3906%
	3	7.0952%	5.0174%	6.2639%	6.7970%	-0.8699%
	4	1.0222%	0.5305%	1.3705%	1.6709%	6.8304%
	5	-1.4798%	0.5277%	1.8877%	-1.0829%	-2.0233%
	6	-1.5021%	-3.4265%	-3.5346%	1.6612%	-0.6836%
	7	-1.1710%	0.4348%	0.8268%	0.8203%	-1.6910%
	8	1.6356%	1.8270%	-2.5951%	-0.2454%	1.7672%
	9	0.4624%	-0.6410%	3.1426%	-0.4103%	5.1217%
	10	-1.0435%	-3.0470%	-2.5808%	0.0000%	-1.6783%
	11	-3.9221%	-3.3711%	-4.7810%	-2.3296%	-4.3616%
	12	1.4441%	2.2600%	1.4585%	0.5038%	4.1406%
2006	1	0.4768%	1.3319%	1.3423%	-1.6041%	0.8079%
	2	0.2375%	0.2203%	0.9479%	0.0000%	1.3082%
	3	2.6918%	0.9852%	2.1466%	1.2685%	-0.8702%
	4	0.0000%	1.1911%	1.3755%	2.4078%	1.0866%
	5	1.1481%	0.2151%	0.2729%	2.1908%	-2.7019%
	6	-1.8434%	-1.8429%	-2.1111%	-4.0120%	3.7768%
	7	-0.3494%	-0.2191%	-1.3072%	-1.6000%	-5.1931%
	8	1.8498%	0.3284%	0.3752%	4.4009%	5.5489%
	9	0.3431%	0.3273%	1.2099%	-1.3083%	0.7077%
	10	-0.3431%	-0.3273%	0.0000%	1.2270%	-4.6923%
	11	0.1145%	-0.4381%	1.1954%	-0.1627%	-0.8163%
	12	1.1377%	0.5473%	0.3650%	0.3252%	3.6581%

2007	1	1.1249%	1.9460%	0.0910%	1.8497%	4.2889%
	2	1.7739%	1.2766%	1.4454%	1.6595%	-0.4829%
	3	2.4961%	0.8421%	0.4474%	0.3911%	3.3994%
	4	0.8538%	0.4184%	1.8576%	2.3912%	1.9200%
	5	1.4768%	2.1684%	2.1674%	0.2284%	0.7838%
	6	1.1452%	0.9151%	0.4279%	3.1440%	1.5494%
	7	1.0299%	1.4071%	1.4413%	0.2943%	0.7022%
	8	1.3232%	0.7952%	1.0883%	3.0393%	4.7820%
	9	1.1061%	1.3766%	0.6639%	1.4857%	2.5742%
	10	3.3435%	2.3167%	3.2550%	2.4281%	4.1673%
	11	4.5376%	3.3774%	4.9971%	4.0301%	1.4073%
	12	2.8248%	3.0883%	4.5412%	4.3793%	8.5660%
Average ROR		**0.1162%**	**0.1780%**	**0.2973%**	**0.4247%**	**0.6762%**
SD (ROR)		**2.8987%**	**3.4045%**	**3.4802%**	**3.6677%**	**4.8296%**

Appendix 6

Private Domestic – Sharpe Ratio of Different Classes

Year	Month	Rf	Monthly Rf	(R-Rf) of Class A	(R-Rf) of Class B	(R-Rf) of Class C	(R-Rf) of Class D	(R-Rf) of Class E
1993	1	3.29	0.27%	-	-	-	-	-
	2	3.03	0.25%	-0.14%	1.33%	0.49%	0.69%	6.57%
	3	3.05	0.25%	-0.59%	1.31%	0.48%	0.41%	3.53%
	4	2.86	0.24%	2.28%	1.53%	1.94%	1.60%	2.21%
	5	3.34	0.28%	3.33%	3.40%	2.32%	4.43%	8.54%
	6	3.51	0.29%	2.18%	5.62%	5.91%	7.36%	5.09%
	7	3.46	0.29%	1.53%	3.88%	6.27%	3.88%	3.44%
	8	3.03	0.25%	0.64%	-0.35%	-1.80%	0.30%	-3.33%
	9	3.04	0.25%	-0.55%	-2.01%	-0.88%	-2.92%	2.57%
	10	2.87	0.24%	-3.16%	-2.13%	-0.13%	1.22%	4.94%
	11	3.15	0.26%	1.46%	2.76%	1.71%	2.91%	2.23%
	12	3.24	0.27%	2.41%	2.67%	2.56%	6.09%	7.73%
1994	1	3.07	0.26%	3.68%	7.79%	9.16%	7.14%	11.57%
	2	3.65	0.30%	3.03%	3.58%	2.47%	3.83%	3.75%
	3	3.99	0.33%	3.77%	8.15%	8.04%	7.12%	10.09%
	4	4.27	0.36%	1.72%	-4.68%	0.13%	3.42%	-0.11%
	5	4.56	0.38%	-2.19%	-2.01%	-1.03%	-7.81%	-3.93%
	6	4.69	0.39%	-1.00%	0.38%	-0.55%	2.68%	-3.45%
	7	4.62	0.39%	-0.91%	-3.61%	-3.87%	-2.34%	-1.01%
	8	4.66	0.39%	2.39%	3.43%	3.01%	5.28%	2.69%
	9	4.78	0.40%	-0.91%	-1.94%	-1.71%	-5.81%	1.66%
	10	5.32	0.44%	-0.10%	0.50%	-2.70%	1.84%	-2.93%
	11	5.75	0.48%	-1.17%	-2.73%	-1.16%	-2.16%	0.64%
	12	6.24	0.52%	-5.39%	-5.18%	-3.19%	-5.31%	1.18%
1995	1	6.82	0.57%	-0.84%	0.35%	-3.85%	-1.64%	-6.75%
	2	6.26	0.52%	3.05%	1.73%	-1.43%	-8.68%	-11.73%
	3	5.71	0.48%	-0.21%	-0.03%	2.13%	5.78%	12.34%
	4	6.06	0.51%	-0.07%	-2.02%	-1.13%	-0.32%	-0.06%

	5	5.76	0.48%	-3.94%	-2.11%	-0.93%	0.16%	-9.79%
	6	5.54	0.46%	-0.82%	-3.62%	-2.91%	-2.02%	4.44%
	7	5.57	0.46%	-2.20%	-1.41%	-4.11%	-5.10%	-4.60%
	8	5.82	0.49%	-0.95%	-2.99%	-0.01%	-1.56%	-3.40%
	9	5.75	0.48%	-3.77%	-3.25%	-5.84%	-3.66%	-5.75%
	10	5.58	0.47%	-1.43%	-0.97%	-1.47%	-2.82%	-0.36%
	11	5.57	0.46%	1.35%	2.42%	1.24%	2.69%	2.71%
	12	5.53	0.46%	0.39%	0.22%	1.80%	-0.96%	-5.95%
1996	1	5.25	0.44%	0.13%	1.49%	-1.32%	0.57%	8.22%
	2	5.09	0.42%	1.61%	3.23%	4.55%	5.58%	1.51%
	3	5.16	0.43%	2.37%	4.86%	1.42%	0.69%	4.61%
	4	5.23	0.44%	-0.52%	-2.29%	1.11%	1.41%	2.70%
	5	5.23	0.44%	0.63%	0.54%	2.50%	1.46%	2.52%
	6	5.47	0.46%	0.77%	0.68%	2.05%	2.28%	-0.88%
	7	5.46	0.46%	0.15%	-1.15%	-2.96%	-0.28%	-0.89%
	8	5.32	0.44%	0.76%	3.43%	1.46%	-1.40%	-0.62%
	9	5.31	0.44%	1.42%	-1.12%	0.07%	3.69%	0.33%
	10	4.98	0.42%	2.40%	4.23%	5.40%	5.31%	5.90%
	11	4.73	0.39%	3.37%	3.50%	3.64%	2.97%	8.54%
	12	4.65	0.39%	3.77%	4.93%	5.19%	6.45%	2.87%
1997	1	4.79	0.40%	3.60%	5.63%	8.23%	11.06%	13.37%
	2	5.01	0.42%	8.72%	6.96%	7.21%	4.15%	1.61%
	3	5.38	0.45%	5.65%	4.47%	3.52%	-0.63%	0.88%
	4	5.62	0.47%	-4.34%	-3.34%	-3.51%	-2.01%	-4.70%
	5	5.62	0.47%	8.80%	9.13%	7.36%	8.12%	14.15%
	6	5.72	0.48%	0.40%	-2.04%	0.88%	0.15%	-3.22%
	7	6.48	0.54%	-4.05%	-3.09%	-2.41%	-2.95%	-0.32%
	8	7.03	0.59%	1.63%	1.67%	2.69%	0.74%	2.15%
	9	6.63	0.55%	0.27%	-1.38%	-3.88%	-0.44%	-6.97%
	10	9.95	0.83%	-0.30%	0.93%	1.66%	1.33%	12.48%
	11	8.79	0.73%	-6.69%	-9.92%	-7.56%	-3.64%	-18.22%
	12	8.53	0.71%	-4.38%	-3.03%	-4.93%	-11.05%	-6.97%
1998	1	9.81	0.82%	-7.61%	-9.25%	-8.01%	-6.55%	-10.27%
	2	6.70	0.56%	-5.28%	-5.20%	-9.47%	-6.79%	-5.24%
	3	6.74	0.56%	0.80%	1.86%	0.32%	-1.21%	-6.33%

	4	6.58	0.55%	-4.10%	-3.87%	-1.35%	-5.23%	-1.73%
	5	7.52	0.63%	-5.23%	-6.18%	-6.75%	-5.38%	-0.47%
	6	9.90	0.83%	-13.50%	-13.03%	-16.14%	-12.86%	-8.02%
	7	8.54	0.71%	-4.10%	-6.04%	-0.17%	-5.42%	-13.05%
	8	11.88	0.99%	-4.59%	-2.51%	-8.99%	-7.63%	-6.71%
	9	8.08	0.67%	-6.38%	-8.14%	-3.15%	2.31%	-6.63%
	10	6.49	0.54%	-4.40%	-2.31%	-5.06%	-8.70%	3.16%
	11	5.91	0.49%	3.66%	14.43%	3.52%	6.78%	-2.49%
	12	5.37	0.45%	3.73%	-5.46%	3.90%	-1.44%	9.72%
1999	1	6.44	0.54%	-1.59%	-1.59%	0.90%	1.24%	-6.75%
	2	6.07	0.51%	-1.38%	-2.65%	-2.62%	-4.51%	-1.22%
	3	5.64	0.47%	-1.05%	0.02%	-4.14%	1.15%	-3.28%
	4	5.00	0.42%	-0.12%	-0.81%	1.88%	0.48%	6.61%
	5	5.35	0.45%	-0.06%	0.82%	0.73%	-0.25%	-0.35%
	6	5.57	0.46%	-0.27%	-2.03%	-1.25%	2.18%	-0.07%
	7	5.64	0.47%	-1.93%	-0.57%	-2.25%	1.35%	-2.45%
	8	5.88	0.49%	-2.98%	-0.59%	0.01%	-4.86%	2.46%
	9	5.72	0.48%	-3.03%	-4.81%	-3.00%	-1.57%	-6.47%
	10	5.62	0.47%	-1.82%	-1.82%	-2.01%	-2.60%	1.47%
	11	5.34	0.45%	-2.88%	-1.71%	-1.91%	-3.04%	5.53%
	12	5.35	0.45%	1.36%	0.92%	1.64%	1.84%	-6.52%
2000	1	5.70	0.48%	1.30%	1.28%	0.85%	1.05%	7.67%
	2	5.87	0.49%	-0.90%	0.02%	-0.69%	0.42%	-5.65%
	3	5.89	0.49%	-3.66%	-2.76%	-1.10%	-0.49%	-0.20%
	4	6.35	0.53%	-1.39%	-2.64%	-1.35%	-1.03%	-1.61%
	5	6.79	0.57%	-4.31%	-4.81%	-5.54%	-0.67%	-4.91%
	6	6.35	0.53%	-5.72%	-5.43%	-3.39%	-8.51%	-2.19%
	7	6.11	0.51%	1.25%	0.19%	-2.20%	-1.39%	-3.60%
	8	6.06	0.51%	-0.51%	0.53%	-0.39%	0.04%	3.00%
	9	6.07	0.51%	1.11%	0.52%	0.06%	0.69%	1.87%
	10	5.89	0.49%	-1.53%	-2.33%	-1.06%	-1.69%	-0.08%
	11	5.78	0.48%	-6.68%	-3.18%	-3.48%	-2.59%	-0.69%
	12	5.53	0.46%	-1.82%	-3.48%	-2.59%	-1.36%	-2.21%
2001	1	4.82	0.40%	-2.04%	-1.76%	-0.76%	-0.51%	-2.39%
	2	4.67	0.39%	-0.64%	-1.01%	-0.87%	-3.96%	-3.94%

	3	4.62	0.39%	1.88%	2.45%	0.69%	1.82%	-3.27%
	4	4.08	0.34%	1.38%	-1.44%	0.49%	0.00%	1.11%
	5	3.60	0.30%	-3.91%	-1.41%	-1.25%	-5.10%	-1.98%
	6	3.45	0.29%	-0.67%	0.70%	1.49%	-1.37%	0.05%
	7	3.43	0.29%	-0.29%	-1.27%	-4.48%	0.32%	-0.40%
	8	3.16	0.26%	-2.84%	-2.02%	-4.00%	0.70%	1.08%
	9	2.19	0.18%	-1.23%	-2.23%	-1.07%	-3.46%	-2.89%
	10	1.90	0.16%	-4.47%	-4.24%	-3.28%	-3.04%	-8.00%
	11	1.79	0.15%	-1.26%	-0.69%	-0.81%	-0.53%	1.32%
	12	1.78	0.15%	0.41%	-0.01%	0.25%	-0.28%	0.34%
2002	1	1.78	0.15%	0.27%	0.39%	0.12%	-0.40%	1.65%
	2	1.83	0.15%	0.94%	-1.23%	-2.02%	-0.15%	2.43%
	3	2.22	0.19%	-2.25%	-0.32%	-0.19%	-0.44%	-1.35%
	4	1.89	0.16%	-2.27%	-1.39%	-0.16%	-0.29%	-0.51%
	5	1.79	0.15%	-1.58%	1.22%	-0.69%	-0.41%	-0.74%
	6	1.75	0.15%	-0.15%	-1.65%	0.39%	-0.66%	-1.58%
	7	1.57	0.13%	-0.71%	-1.80%	-2.86%	-0.26%	-3.06%
	8	1.51	0.13%	-3.22%	-4.86%	-2.51%	-1.17%	-2.13%
	9	1.63	0.14%	-4.41%	-1.02%	-3.30%	-1.59%	-3.08%
	10	1.64	0.14%	-0.29%	-4.37%	0.30%	-0.40%	0.25%
	11	1.39	0.12%	-1.85%	0.19%	0.03%	-0.12%	2.69%
	12	1.37	0.11%	-0.43%	-0.11%	-2.77%	-2.81%	1.26%
2003	1	1.26	0.11%	-2.04%	-2.44%	0.19%	-0.79%	-0.85%
	2	1.22	0.10%	-0.92%	0.53%	-1.15%	-2.75%	-5.50%
	3	1.07	0.09%	-1.74%	-5.23%	-3.45%	-2.81%	-2.50%
	4	1.23	0.10%	-1.11%	-1.43%	-0.41%	-1.71%	-1.88%
	5	1.04	0.09%	-2.13%	-0.93%	-1.34%	-0.23%	-2.03%
	6	0.84	0.07%	-1.63%	-0.24%	-1.18%	-1.56%	0.63%
	7	0.94	0.08%	-1.31%	-1.61%	-2.50%	-2.66%	2.26%
	8	0.95	0.08%	0.27%	0.26%	-0.57%	1.90%	0.33%
	9	0.64	0.05%	3.92%	2.81%	7.39%	6.24%	1.83%
	10	0.38	0.03%	3.62%	3.72%	4.59%	4.54%	6.79%
	11	0.26	0.02%	1.27%	1.72%	1.28%	0.65%	1.58%
	12	-0.02	0.00%	1.76%	1.25%	0.72%	6.26%	4.66%

2004	1	0.10	0.01%	4.93%	6.60%	7.42%	2.49%	7.42%
	2	0.08	0.01%	4.12%	5.09%	7.77%	6.90%	4.24%
	3	0.14	0.01%	5.20%	6.28%	8.79%	9.95%	6.72%
	4	0.57	0.05%	0.64%	2.64%	0.29%	2.12%	-1.22%
	5	0.54	0.05%	-0.87%	-3.64%	-2.20%	-2.21%	1.32%
	6	0.61	0.05%	-4.40%	-3.38%	-4.98%	-4.20%	3.01%
	7	0.96	0.08%	0.35%	0.06%	0.76%	1.32%	-2.75%
	8	0.81	0.07%	4.27%	3.12%	4.48%	-0.17%	0.51%
	9	1.03	0.09%	2.08%	5.14%	3.71%	7.15%	8.82%
	10	0.24	0.02%	3.79%	3.28%	4.90%	5.51%	2.84%
	11	0.39	0.03%	-2.25%	-1.97%	-0.77%	0.72%	0.14%
	12	0.25	0.02%	0.64%	1.20%	-1.08%	1.00%	2.92%
2005	1	0.71	0.06%	2.78%	2.22%	4.92%	4.29%	2.56%
	2	1.64	0.14%	3.61%	5.50%	3.05%	-1.75%	2.25%
	3	2.53	0.21%	6.88%	4.81%	6.05%	6.59%	-1.08%
	4	1.80	0.15%	0.87%	0.38%	1.22%	1.52%	6.68%
	5	2.88	0.24%	-1.72%	0.29%	1.65%	-1.32%	-2.26%
	6	2.91	0.24%	-1.74%	-3.67%	-3.78%	1.42%	-0.93%
	7	3.14	0.26%	-1.43%	0.17%	0.57%	0.56%	-1.95%
	8	3.48	0.29%	1.35%	1.54%	-2.89%	-0.54%	1.48%
	9	3.65	0.30%	0.16%	-0.95%	2.84%	-0.71%	4.82%
	10	3.85	0.32%	-1.36%	-3.37%	-2.90%	-0.32%	-2.00%
	11	3.78	0.32%	-4.24%	-3.69%	-5.10%	-2.64%	-4.68%
	12	3.78	0.32%	1.13%	1.94%	1.14%	0.19%	3.83%
2006	1	3.52	0.29%	0.18%	1.04%	1.05%	-1.90%	0.51%
	2	3.87	0.32%	-0.08%	-0.10%	0.63%	-0.32%	0.99%
	3	3.98	0.33%	2.36%	0.65%	1.81%	0.94%	-1.20%
	4	3.87	0.32%	-0.32%	0.87%	1.05%	2.09%	0.76%
	5	4.02	0.34%	0.81%	-0.12%	-0.06%	1.86%	-3.04%
	6	4.20	0.35%	-2.19%	-2.19%	-2.46%	-4.36%	3.43%
	7	3.84	0.32%	-0.67%	-0.54%	-1.63%	-1.92%	-5.51%
	8	3.64	0.30%	1.55%	0.03%	0.07%	4.10%	5.25%
	9	3.67	0.31%	0.04%	0.02%	0.90%	-1.61%	0.40%
	10	3.60	0.30%	-0.64%	-0.63%	-0.30%	0.93%	-4.99%
	11	3.58	0.30%	-0.18%	-0.74%	0.90%	-0.46%	-1.11%

	12	3.40	0.28%	0.85%	0.26%	0.08%	0.04%	3.37%
2007	1	3.86	0.32%	0.80%	1.62%	-0.23%	1.53%	3.97%
	2	3.79	0.32%	1.46%	0.96%	1.13%	1.34%	-0.80%
	3	3.63	0.30%	2.19%	0.54%	0.14%	0.09%	3.10%
	4	3.83	0.32%	0.53%	0.10%	1.54%	2.07%	1.60%
	5	4.14	0.35%	1.13%	1.82%	1.82%	-0.12%	0.44%
	6	3.97	0.33%	0.81%	0.58%	0.10%	2.81%	1.22%
	7	3.77	0.31%	0.72%	1.09%	1.13%	-0.02%	0.39%
	8	4.04	0.34%	0.99%	0.46%	0.75%	2.70%	4.45%
	9	3.37	0.28%	0.83%	1.10%	0.38%	1.20%	2.29%
	10	2.38	0.20%	3.15%	2.12%	3.06%	2.23%	3.97%
	11	0.51	0.04%	4.50%	3.33%	4.95%	3.99%	1.36%
	12	2.11	0.18%	2.65%	2.91%	4.37%	4.20%	8.39%
Average R-Rf (Corr. to 2 d.p.)				**-0.22%**	**-0.16%**	**-0.04%**	**0.09%**	**0.34%**
SD (Corr. to 2 d.p.)				**2.96%**	**3.46%**	**3.55%**	**3.73%**	**4.89%**
Sharpe Ratio (Corr. to 4 d.p.)				**-0.0753**	**-0.0466**	**-0.0119**	**0.0228**	**0.0689**